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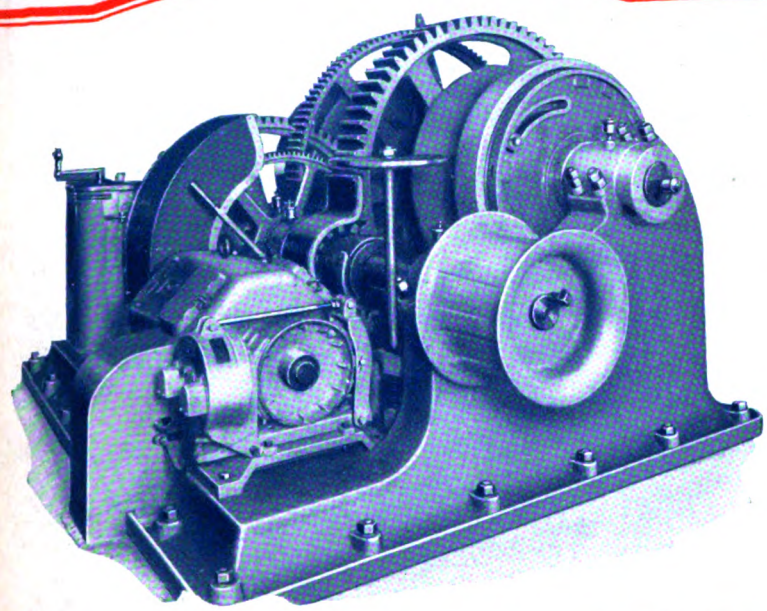

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Your Guide To this Issue

Apply the Law

WHY should reprisals be feared if section 28 is enforced. We are a party to all trade through our ports and any unfair tactics would disturb such trade to the injury of the foreigner quite as much as to the citizen.

See Page 11

French Liner

THE French are slowly, patiently and with utmost care, building the sixth largest, and perhaps in appointments, the finest ocean liner, the ILE DE FRANCE, recently launched.

See Page 13

Foreign Motorships

ILLUSTRATIONS and particulars are given for a number of recently built foreign cargo vessels, diesel engined. Long voyage freighters are thus able to operate cheaply and to carry more.

See Page 15

Port Charges

UNDER this head come all manner of disbursements a ship must make while in port. These charges are too high. What is the remedy?

See Page 19

Pier Management

A WELL-KEPT up, clean, orderly pier is an efficient one. Proper maintenance means not the cheapest but the best, for the purpose intended.

See Page 33

Lake Levels

THE seriousness of low water on the Great Lakes cannot be overestimated. Allowable draft is now only 17 feet 9 inches. A proposal is made to raise the levels.

See Page 36

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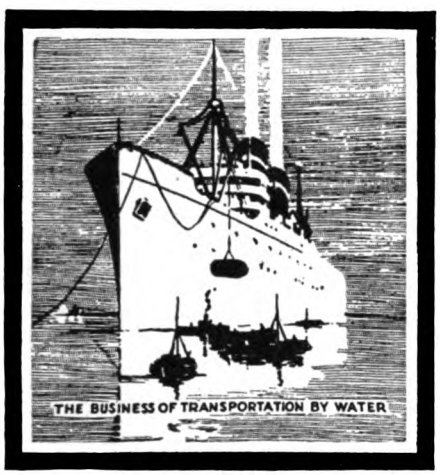
Marine Review

The National Publication Covering the Business of Transportation by Water

FOUNDED 1878



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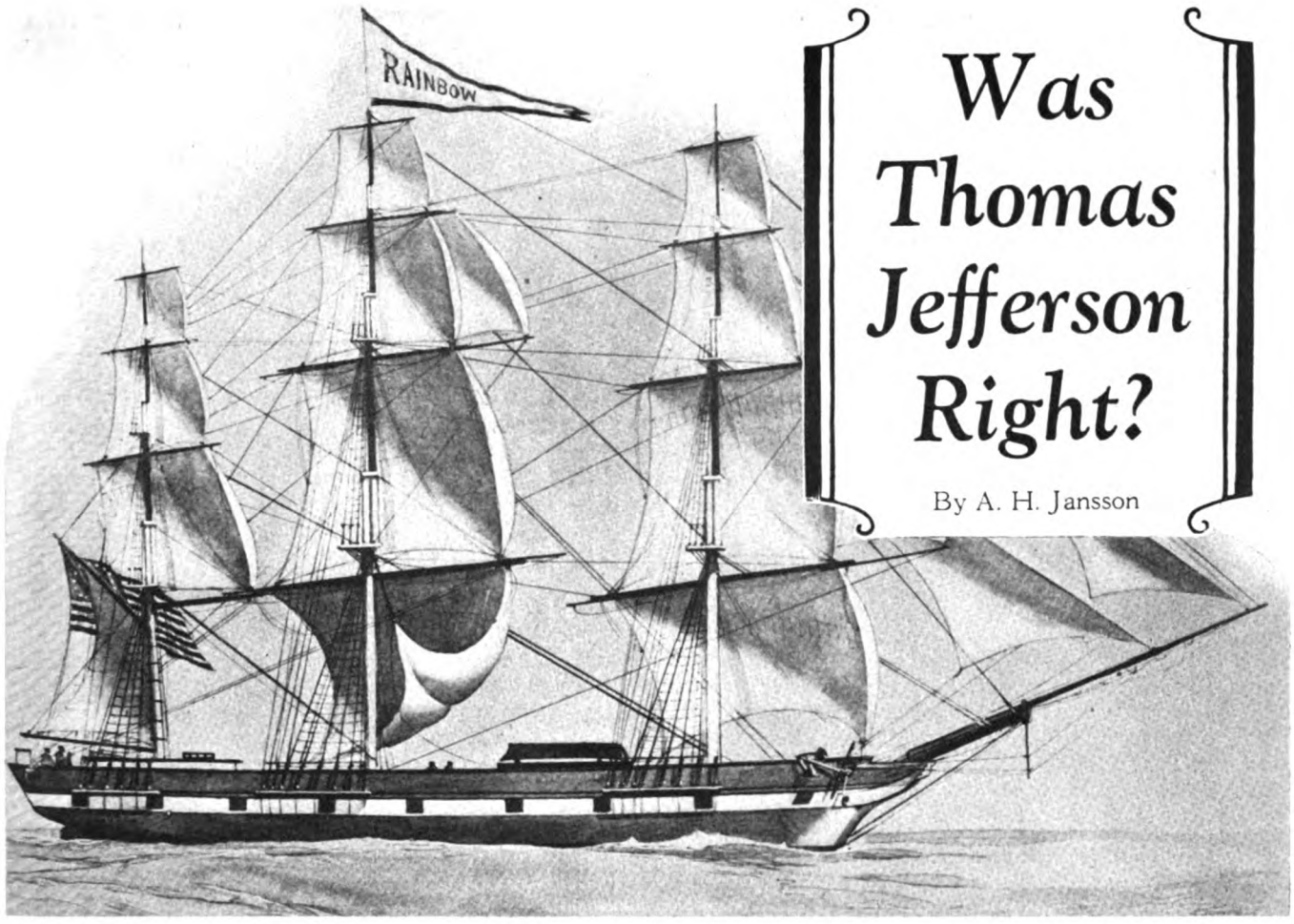

Was Thomas Jefferson Right?

By A. H. Jansson

One of the famous vessels of an era when the American flag was a familiar sight in all parts of the world—On her first voyage the RAINBOW netted her owners 200 per cent of her initial cost—Sailed February, 1845 for China—Back home in September—Reported lost off Cape Horn in 1848

IN A report dated Dec. 16, 1793, addressed to the house of representatives, on the privileges and restrictions on the commerce of the United States in foreign countries, Thomas Jefferson, then secretary of state, made the following significant statements in regard to our merchant marine:

"Its value as a branch of industry is enhanced by the dependence of so many other branches on it. In times of general peace it multiplies competitors for employment in transportation and so keeps that at its proper level; and in times of war, that is to say, when those nations who may be our principal carriers, shall be at war with each other, if we have not within ourselves the means of transportation, our produce must be exported in belligerant vessels at the increased expense of war freight and insurance and the articles which will not bear that must perish on our hands.

"But it is as a resource of defense that our navigation will admit neither neglect or forebearance. The position and circumstances of the United States leave nothing to fear on their landboard, and nothing to desire beyond their present rights. But on their seaboard they are open to injury, and they have there too a commerce which must be protected. This can only be done by possessing a respectable body of citizen-seamen, and of artists and establishments in readiness for shipbuilding.

"The carriage of our own commodities, if once established in another channel, cannot be resumed in the moment we may desire. If we lose the seamen and artists whom it now occupies, we lose the present means of defense, and time will be requisite to raise up others, when disgrace or losses shall bring home to our feelings the error of having abandoned them. The materials for maintaining our due share of navigation, are ours in abundance. And as to the mode of using them, we have only to adopt the principles of those who put us on the defensive, or others equivalent and better fitted to our circumstances."

This expresses clearly and forcibly our present situation. It is based on the fundamental law of self-preservation and the natural desire to avoid dependence upon the convenience of others. We do not agree with those who believe that a just and fair assertion of our right to a share in the carrying of our own commerce will irritate and annoy other nations and ultimately lead to

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unfriendly relations. To carry this a logical step further it might with equal force be argued that it is not gentlemanly or friendly to compete in foreign markets and that we should step aside in favor of other nations who being poorer than we are, need the business more than we do.

Let us make it clear to all nations that we wish to live and to let live upon the seas as well as upon the land, that we have no ambitions to monopolize either trade or the carrying of it.

It is hardly necessary to point out that no nation on earth approves of our coastwise laws and that if left to their option there would be swarms of foreign vessels in this trade. But this law is not a source of irritation, it is accepted as an inevitable fact.

We have always had a certain amount of foreign going tonnage, fluctuating from the high point before the Civil war to the low point in the decade before the Great war. There is now, due to the War, an appreciably larger tonnage engaged in foreign trade. It is generally agreed that nothing can stand still, it must either retrograde or progress, and that applies to our overseas shipping. What shall it be allowed to do, retrograde?

The shipping board conduct of the merchant marine must be considered in the light of a necessary temporary evil, a stop gap. No real permanent policy for fostering and upbuilding the merchant marine can ever be worked out around a bureaucratically controlled or government owned merchant marine. It is managing wastefully and inefficiently, as any government agency similarly constituted would inevitably manage, a business which in all the world's history has never been successfully carried on except by means of private enterprise and individual responsibility. Private enterprise must therefore be encouraged and supported.

Enforce the Present Law

Bearing in mind then the fact that we do have the nucleus at least of an American merchant fleet engaged in foreign trade, what practical steps can and should be taken to maintain it and to build it up? Certainly no fair-minded foreigner will object to our doing the best we can to build up what we already have. Candid opinion the world over will admit that we have the right to do so.

In looking about for workable means to put into effect the policy advocated by Thomas Jefferson 133 years ago, what can be done? There is section 28 of the merchant marine act of 1920, a law of the land—at present not enforced.

Three Presidents have avoided the issue presumably because of anticipated objections on the part of other nations who are as strenuous in protecting every advantage of their shipping as we are weak in support of our own. Our only reason for invoking this law would be to attract a reasonable amount of business to our ships to help them to overcome the differential in operating costs due to our higher standards of living for the sailor and the shipbuilders. And this act simply says in effect that only goods and passengers brought in or to be carried out in American vessels shall be allowed a lesser through rate from and to points in the United States than the domestic rate between the same points wholly within the United States. Why not apply this law?

Why City of Rome Was Not To Blame

BY CAPT. LUTHER B. DOW

ON SEPT. 25, 1925, at about 10:24 p.m. in the vicinity of Block Island, the S. S. CITY OF ROME and U.S.S. S-51 came into collision, the bow of the CITY OF ROME coming into contact with the port side of S-51, causing S-51 to sink. There were three men saved from S-51 and their testimony was taken before the United States local inspectors and the naval court of inquiry. It is in evidence that the three men that were saved were asleep at the time of the collision and as they were below they had no knowledge of the course steered by S-51 and they did not know what lights she carried nor what speed she was running at. In the evidence submitted by the navy officers, they placed S-51 at 8 p.m. on Sept. 25, at five miles north of Block Island and at that time, the evidence shows, the CITY OF ROME was fifteen miles south of S-51 and heading on her regular course of E.N.E. This shows plainly that S-51 was clear on the port side of the CITY OF ROME when the latter was still on her E.N.E. course. At 10 p.m., a small white light was sighted by the CITY OF ROME on her starboard bow. At 10:24 p.m., or strictly speaking at five seconds before that, a small red light appeared under the small white light clear on the starboard bow of CITY OF ROME, and then the collision took place. The evidence absolutely proves that S-51 had to cross the course of the CITY OF ROME to get on the starboard side. and was trying to cross the course of the CITY OF ROME a second time when the collision took place.

No whistles were blown by either vessel. The reason that the CITY OF ROME did not change her course or speed was because she could only see a white light four points on her own starboard bow. Why S-51 did not make any sound or show a side-light, we do not know, but as the CITY OF ROME was all lighted up with a head light, stern range light, good stern light, good lights on each corner of her after house, four good lights, not screened, on each side, smoking room on the upper deck all lighted and the lower deck lighted with nine good lights, S-51 must have seen and must have known that she was approaching a large steamship, both when she was on the port side of the CITY OF ROME and also when she was on the starboard side of the CITY OF ROME. All of the above is in the evidence and is absolutely true.

The above facts are my reasons for saying that the CITY OF ROME was not at fault, and the raising of the submarine will not add to or take away from the evidence as it now stands.

Another Point of View

In the February 1926 number of Marine Review a report of the findings of the naval court of inquiry, relative to the sinking of the S-51 by the S. S. City of Rome, was published as representing the navy's view of the unfortunate disaster.

We are glad therefore at this time to give the merchantman's side of the controversy as told by Captain Dow who is the secretary-treasurer of the American Steamship Licensed Officers Association. Inc., 15 Moore street, New York City.

William E. C. Nazro, welfare manager, Plymouth Cordage Co., Plymouth, Mass., died recently at his home in Dorchester, Mass.

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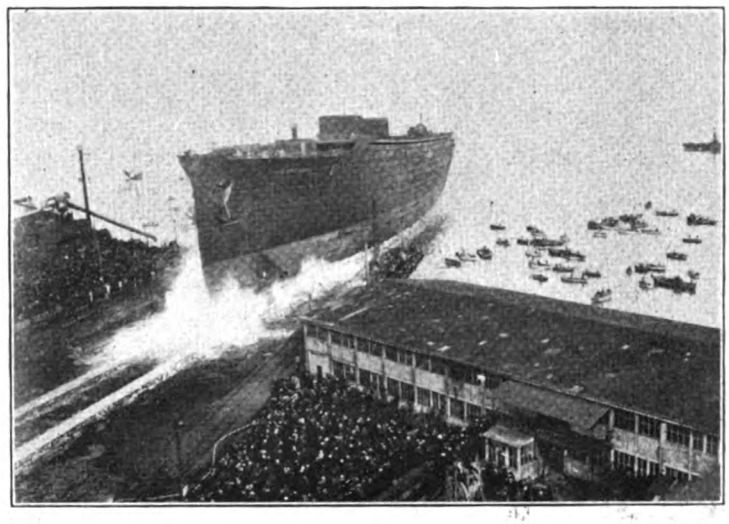
Largest French Liner Launched

Ile de France *is* World's Sixth *Largest Vessel*



Will be Ready for Service in May, 1927

BY VINCENT DELPORT

ON MARCH 14 the largest transatlantic steamer built in France was launched at the yards of the Chantier et Ateliers de Saint-Nazaire, Penhoet, where it is under construction for the Compagnie Generale Transatlantique. The vessel was named Ile de France. It will be put in service between Havre, Plymouth and New York when completed in the spring of 1927. The new ship is built on the same general lines as the PARIS, of the same company.

The characteristics of the boat are as follows: Length 241 meters (790.5 feet), total width 28 meters (91.8 feet), depth 21.50 meters (70.5 feet), displacement about 41,000 tons, burden 11,500 tons, gross tonnage about 40,200 tons; the staff and crew will comprise 803 men; accommodation is devised 1200 in first and second class and 600 in cabins in the third class.

The ILE DE FRANCE will number nine decks, five of which will be continuous. The two upper decks will comprise a promenade deck and one for the life-boats; the latter deck will be 30.45 meters (100 feet) above the keel. The whole length of the hull is constructed with a double bottom and divided by 15 watertight partitions into 16 compartments.

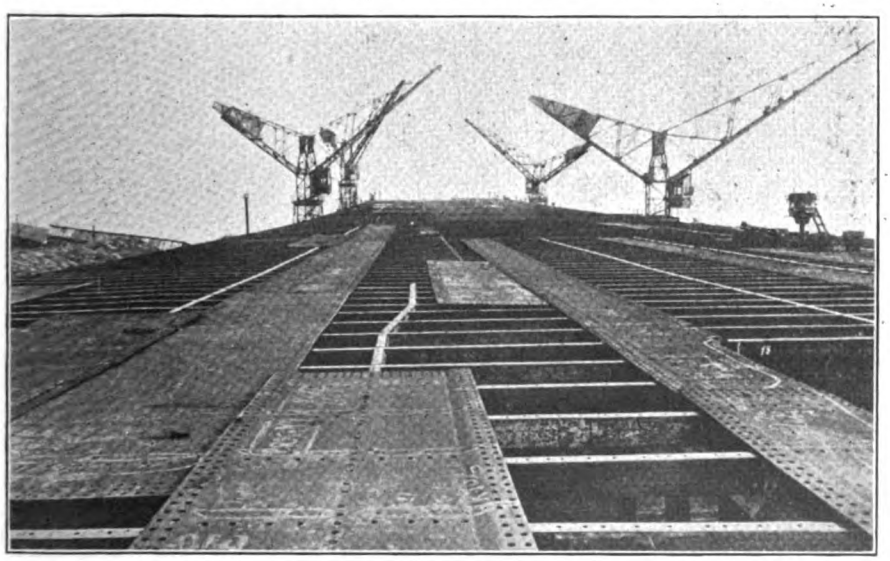
In the central part, in a line with the boilers and machinery, there are compartments on each side which will be used as oil bunkers. In case of damage the inrush of water will be checked both in the horizontal direction and in the vertical direction. To prevent, in such an occurrence, the ship from heeling, two pumps which will always be under pressure will enable a sufficient quantity of the fuel oil to be transferred from one side to the other in order to re-establish the balance.

A special steam canalization will be fitted in the holds, boiler and engine rooms as a precaution against fire. Twenty-six fire signals will be connected with two receiving-apparatus, one on the bridge, the other in the engine room. These fire signals will be installed in those compartments where men will not be constantly on duty. In addition, the linen rooms and drying rooms will be fitted with electric thermometers which, in case of an abnormal rise in temperature, will bring into action bells which will be placed outside those rooms.

The capacity of the life-boats will be in excess of the minimum required by the regulations of the recent international convention for life-saving at sea. There will be 36 life-boats, two whale-boats and two power-boats fitted with wireless apparatus and which will be used to tow the life-boats.

The ship's wireless apparatus will be of the latest type with a range which in daylight would exceed 500 to 550 miles, and from 850 to 900 miles at night. There will be two additional emergency sets; one will receive its energy from an emer-

(*Continued on Page* 60)



ILE DE FRANCE—NEW TRANSATLANTIC LINER FOR THE FRENCH LINE—UNDER CONSTRUCTION AT THE CHANTIER ET ATELIERS DE SAINT-NAZAIRE, PENHOET—NOTE THE BALANCED DERRICKS USED IN BUILDING THE SHIP

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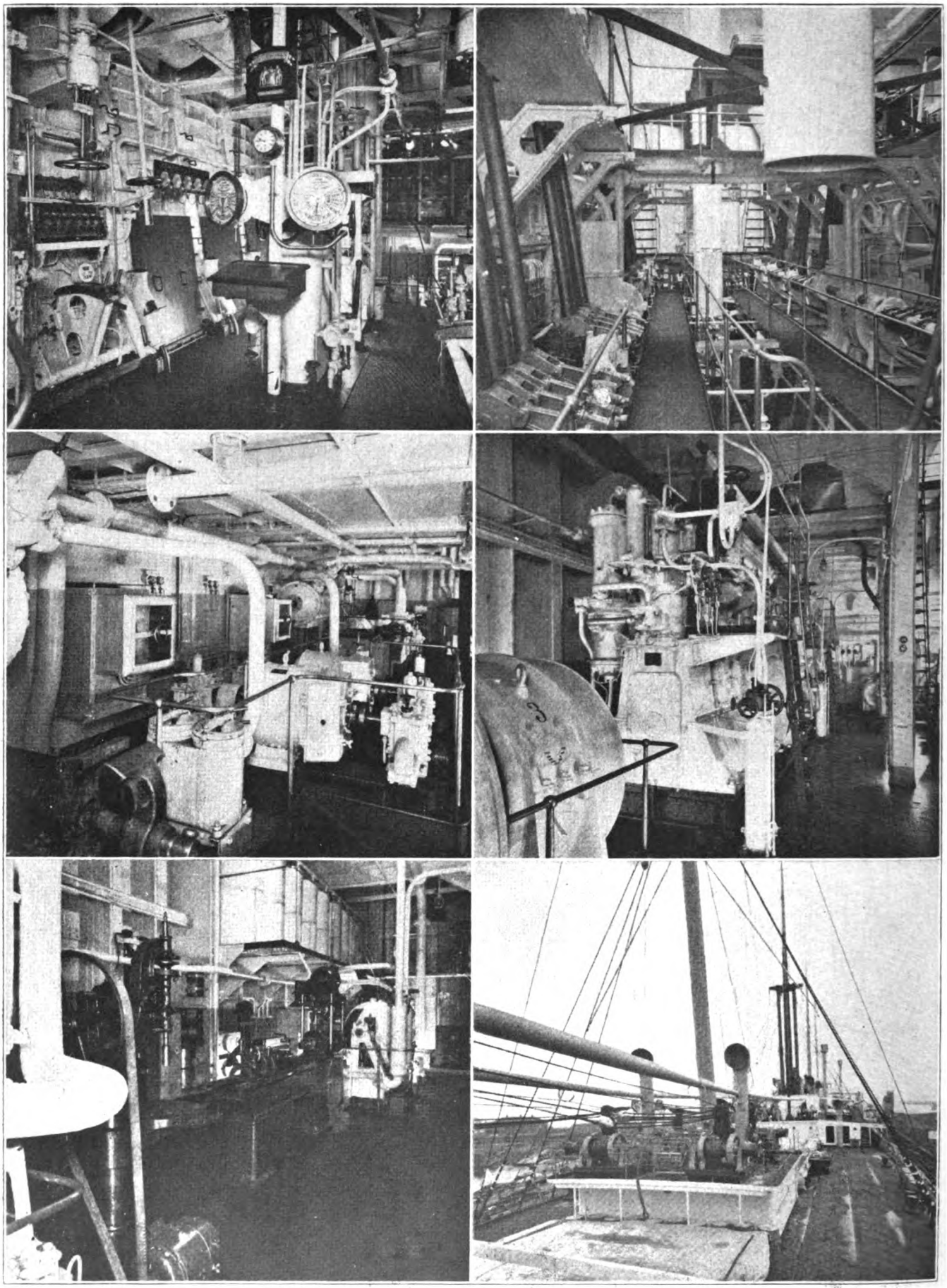

VIEWS OF THE TWIN SCREW M. S. DANMARK—TWO 6-CYLINDER, 4-CYCLE, SINGLE-ACTING DIESELS—(UPPER LEFT) MANEUVERING PLATFORM BETWEEN MAIN ENGINES LOOKING FORWARD—(UPPER RIGHT)—MAIN ENGINES FROM LOWER PLATFORM—(CENTER LEFT)—VIEW OF PUMPS IN FORWARD END OF ENGINE ROOM—(CENTER RIGHT)—AUXILIARY ENGINES PORT SIDE—(LOWER LEFT)—STARBOARD SIDE OF ENGINE ROOM, DONKEY BOILER IN BACKGROUND—(LOWER RIGHT)—DECK VIEW FROM BRIDGE LOOKING FORWARD

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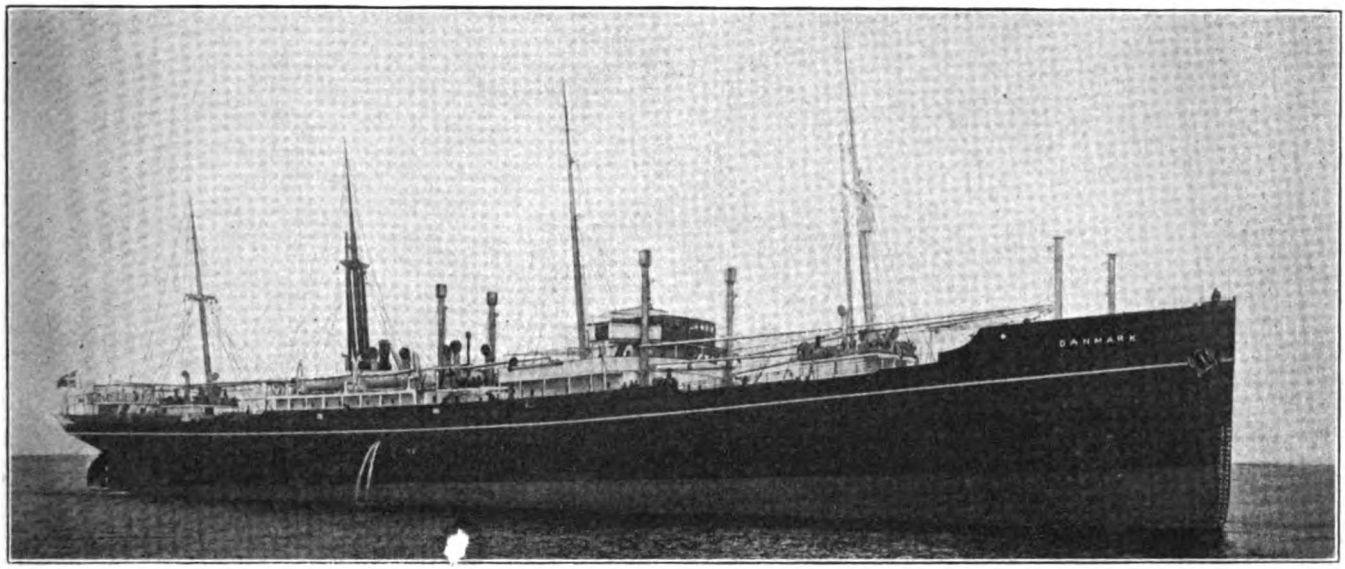


Twin screw M. S. DANMARK—New 12,350 tons deadweight cargo vessel for the East Asiatic Co. Speed 12.75 knots

Recent Foreign Diesel Vessels

Incorporate Modern Practice

LESS than one-third of the steel powered tonnage under construction in the United States is equipped with diesel engines while according to latest returns Lloyds shows that motorship construction throughout the world represents 913,-099 gross tons of the 2,010,206 gross tons of total shipbuilding under way, at the end of March.

Economic reasons are at the basis of this disparity. The diesel engine is now beginning to interest the American ship owner but only to a mild degree compared with the interest shown abroad. This is not due to a less progressive or daring outlook but rather to the fact that home competition has not yet made itself felt and foreign competition is not seriously considered because the government of the United States is paying for the greater part of that.

In the meantime on the other side of the Atlantic fine fast modern diesel ships are being completed and entered in service with clock-like regularity. A number of comparatively new foreign diesel vessels are described and illustrated for the purpose of arousing a greater interest in and a greater appreciation of the economic value of this type of motive power.

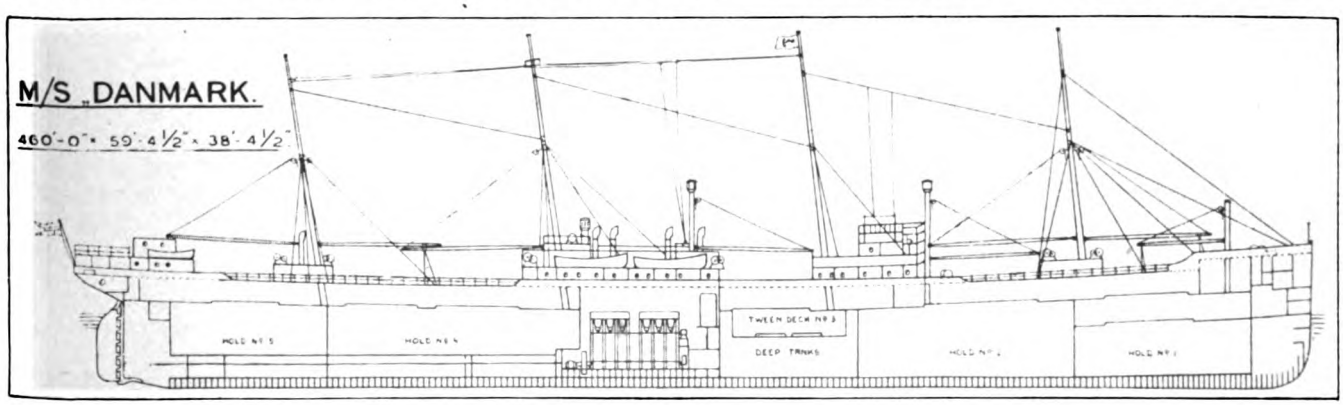
Twin Screw Motorship Danmark

The new motorship DANMARK. is the latest addition to the large fleet owned by the East Asiatic Co., Copenhagen. This fleet consists almost entirely of motorships of an aggregate deadweight tonnage of about 191,000. The principal particulars of the new vessel are:

Length between p. p. ft. in.....	460 0
Breadth molded ft. in.....	59 4½
Depth to upper deck ft. in.....	38 4½
Gross tonnage registered.....	8391
Net tonnage registered.....	5342
Capacity, grain cu. ft.....	647,300
Height double bottom in.....	46
Deadweight tonnage	12.350
Draft loaded ft. in.....	28 10
Designed sea speed, knots.....	12.75

Built to the highest class of British Lloyd's 100 A.1. special survey, with freeboard, the vessel has seven watertight bulkheads, six hatchways and five cargo holds, three forward and two abaft the motor room. The center-lower-hold is arranged with a deep tank for carrying vegetable oil and is fitted with special hatches and expansion trunk.

The double bottom extends the whole length of the ship and can be used for carrying either fuel oil or water-ballast. The fuel oil capacity is 1460 tons and the total water- ballast capacity, including the fore and aft peak tanks, is 1750 tons. Two



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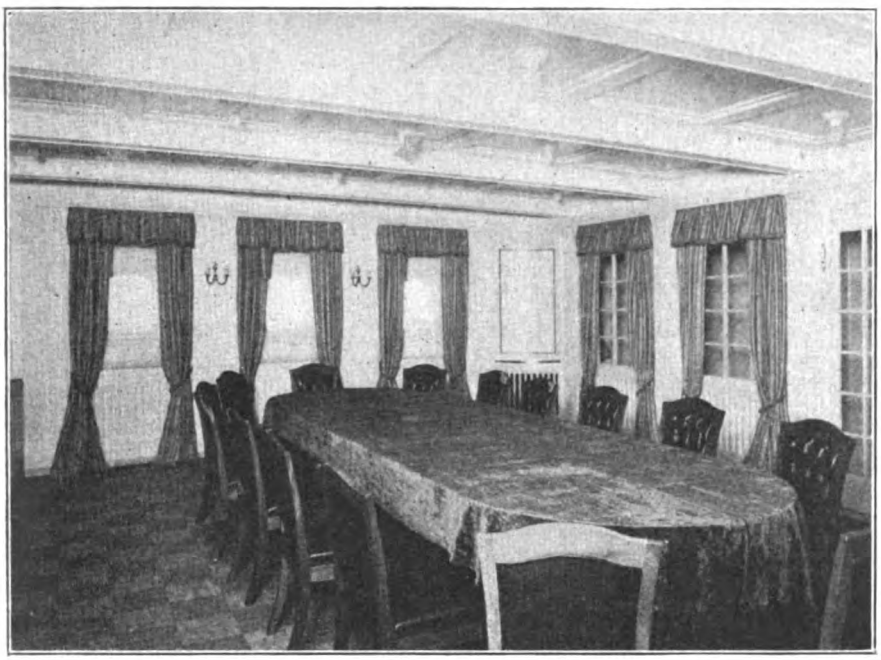
complete steel decks run throughout the length of ship, supported by two rows of widely spaced pillars giving clear and spacious holds.

The cargo hatches are all large, No. 2 hatch being 40 feet long; the width of the hatches is 20 feet. Cargo handling equipment is specially designed to meet the requirements of the far-eastern trade. The cargo derricks are of weldless steel tube, the number and lifting capacity being as follows: No. 1 hatch, 2—three tons and 2—five tons; No. 2 hatch, 2—three tons, 2—five tons and 1—forty tons; No. 3 hatch, 2—three tons; No. 4 hatch, 2—five tons and 1—thirty tons; No. 5 hatch, 2—five tons and No. 6 hatch, 2—five tons.

For the working of the cargo derricks there are: 10—three-ton winches, 4—five-ton winches and 2—seven ton winches. A seven-ton winch is placed aft for warping purposes. The winches are electrically driven and are of the standard type manufactured by Thomas B. Thrige, Odense, Denmark, who has also supplied the electrical windlass. The steering gear is of the John Hastie electro-hydraulic type and is controlled by telemotor from the bridge; an emergency hand steering-gear is arranged aft.



DINING SALOON M. S. DANMARK—SEATS 16 PERSONS

Quarters for Twelve Passengers

All the accommodations are heated by steam radiators with steam supplied by an oil-fired donkey boiler placed in the engine room. A water and steam fire extinguishing plant is fitted. The provision rooms are refrigerated. The refrigerating machinery and ice generator were supplied by Thomas Ths. Sabroe & Co., Aarhus, Denmark. The oil-fired galley range was supplied by the United Iron Works, Copenhagen. A fresh-water distiller with a capacity of 5 tons of drinking water in 24 hours is installed in the motor room. There is a wireless station of 2-kilowatt capacity.

In the saloon deck house, accommodation is arranged for the captain, chief steward and for 12 passengers. The dining saloon has seating accommodation for 16 persons and is attractively fitted out with furniture upholstered in red Spanish leather. The saloon walls are finished in light gray and old gold and large windows are fitted in the walls to the saloon corridors. The passenger cabins are paneled and finished white. Each cabin has two berth, two folding lavatories, spacious wardrobes and a table. The floor is laid with linoleum covered by a carpet.

The captain's quarters are located on top of the saloon deck, and include living-room, bed-room, lavatory, and a smoking saloon with a marble fireplace. The floors in the saloon, saloon corridors and the smoking saloon are laid with ruboleum tiles. On the flying bridge is a chart house, containing a small sleeping cabin with wash basin for the captain. The officers and engineers have their cabins in a large house around the engine casing where the galley is also placed. In all these houses large brass framed sliding windows are fitted, these windows as well as the doors are provided with mosquito screens. Two hospitals, a cabin for two pilots and a messroom for stevedores are located amidships.

The seamen and motormen are berthed in the after deck house on the poop deck in cabins for two men each. The messrooms for the crew are arranged in a deck house above the sleeping quarters. Bathrooms and lavatories for the crew are arranged in the side houses abreast the aft deck house. Throughout the ship an ample number of lavatories and bathrooms are arranged to meet the requirements on board. The cooling water from the main engines is utilized for bathing purposes.

Diesel Propelling Machinery

The entire vessel both hull and machinery was constructed by Burmeister & Wain Ltd., Copenhagen. The propelling machinery consists of two 6-cylinder four-cycle single-acting diesel engines of the builders standard type with forced lubrication. The main particulars of the engines are:

Indicated horsepower	5400
Revolutions per minute	115

All the auxiliary machinery is electrically driven, the current being supplied by three dynamos each of 65 kilowatts, constructed by Thomas B. Thrige. The voltage for power purposes is 220 volts and for lighting purposes 110 volts, the current being transformed by means of a rotary transformer. Any one of the dynamos is sufficient to supply the current required for working when at sea, while only two have to be in operation when in port with all the winches working. Ballast, bilge and sanitary pumps are all electrically driven. A pump for dealing with the cargo oil is also fitted.

The trial trip of the DANMARK tool place on Dec. 5 1925 in the sound at Copenhagen, and over the measured mile the following results were obtained:

Indicated horsepower	5370
Revolutions per minute	119.5
Mean speed, knots	13.9
Displacement in tons	7200
Fuel, grams per i. h. p. hour	138

The figure for the fuel consumption includes the consumption of the auxiliary engines producing the current for operating the auxiliary machinery, steering gear and electric light, while the indicated horsepower referred to represents the indicated horsepower of the main engines. After a successful trial trip, at which the technical staff of the East Asiatic Co. was present, the motorship DANMARK took on cargo and left Copenhagen on her maiden voyage to the Far East.

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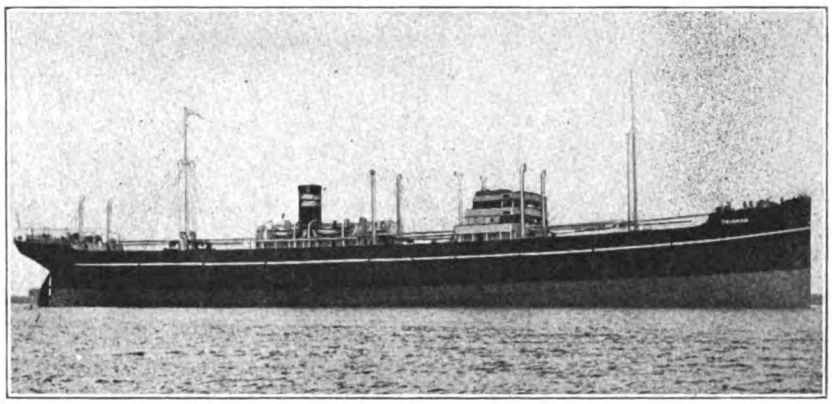
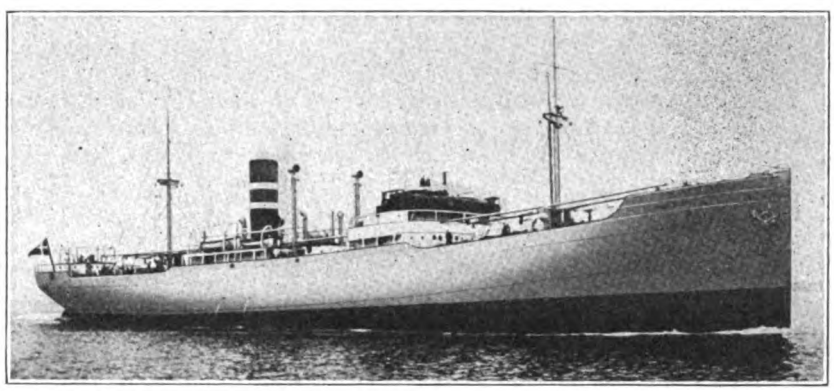
TRIANON-Ocean Cargo Vessel-Twin Screw-Diesel



THE last of three 9600 twin screw diesel sister ships built by the Odense Steel Shipyard, Denmark, for Wilh. Wilhelmsen, Oslo, completed sea trials Feb. 23, 1926, after which the vessel entered on her service between Norway and Australia. The principal particulars are: Length between perpendiculars, 435 feet; breadth molded, 56 feet; depth molded to shelter deck, 39 feet; depth to main deck, 30 feet 6 inches; draft loaded, 26 feet 5 inches; carrying capacity, 9550 tons; cubic capacity grain and bales respectively, 582,000 and 524,000 cubic feet; total fuel capacity, 1410 tons; speed about 13¼ knots. Built to Lloyd's 100 A-1 of open shelter deck type, by closing tonnage hatchway, this vessel is permitted to load to 28 feet draft with a deadweight of 10,500 tons. The five hatchways on the shelter deck have a breadth of 18 feet and an average length of 35 feet. Cargo handling gear is most complete with 5-ton, 1½-ton and a 25-ton derricks and winches to correspond.

The propelling machinery consists of two Burmeister & Wain single acting diesel engines, with a total output of 5500 indicated horsepower at 130 to 135 revolutions per minute. All the auxiliaries are electrically driven with current supplied by three 100-kilowatt generators direct connected to three 3-cylinder diesel engines of 150 brake horsepower each.

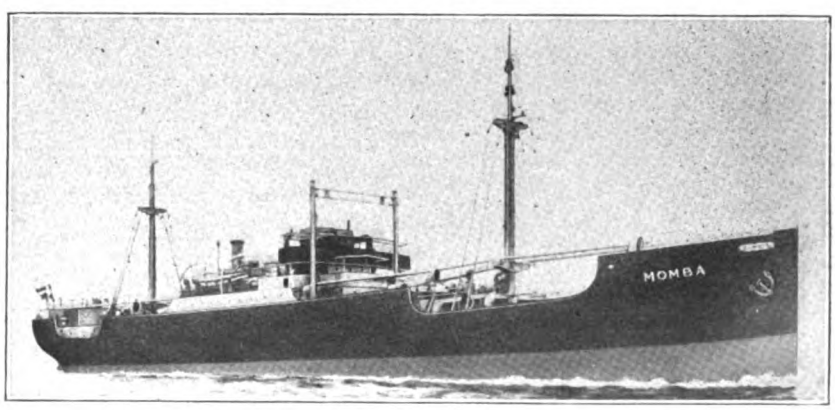
NORDPOL-Ocean Cargo Vessel-Twin Screw-Diesel



ON FEB. 3, 1926, the twin screw closed shelter deck M. S. Nordpol, the third similar vessel built by Burmeister & Wain for the Norden Steamship Co., Ltd., Copenhagen, ran successful sea trials. The two sister vessels, the Nordbo and Nordhval, have been in service since November 1923 and June 1924 respectively. The principal particulars are: Length between perpendiculars, 380 feet; breadth molded, 53 feet 6 inches; depth, 36 feet; draft loaded, 26 feet 7 inches; deadweight capacity about 9000 tons; gross tonnage about 5886; capacity in bales, 434,000 cubic feet; speed at sea normal, 11 knots; fuel consumption per 24 hours, 8 tons. This vessel is built to the highest class in Lloyds. There are five hatches served by 10 5-ton derricks and 3-ton winches.

The propelling machinery consists of two Burmeister & Wain diesel engines of the new light built type for twin screw vessels. The total indicated horsepower is 2600 at 130 revolutions per minute. All auxiliaries are electrically driven with current supplied by three 50-kilowatt generators direct connected to three auxiliary diesel engines of 75 brake horsepower each.

MOMBA-Ocean Cargo Vessel-Single Screw-Diesel



A FAST economical and well planned cargo vessel, the single screw M. S. Momba is the second freighter of her type built and engined by Burmeister & Wain for the Adelaide Steamship Co., Ltd. Adelaide, Australia. She completed successful sea trials on March 3, 1926 and immediately loaded cargo for her maiden voyage to Australia. The principal particulars of this vessel are: Length between perpendiculars, 331 feet; breadth molded, 44 feet 6 inches; depth to upper deck, 25 feet 6 inches: gross tonnage, 3021; net tonnage, 1758; capacity in grain, 282,250 cubic feet; deadweight, 5100 tons; mean speed on trials 13.17 knots.

The propelling machinery is one eight cylinder four cycle single acting Burmeister & Wain standard type diesel engine of 2500 indicated horsepower at 95 revolutions per minute. All of the auxiliaries are electrically driven, with current furnished by two generators of 66 kilowatts each and one of 33 kilowatts, direct connected to two twin cylinder and one single cylinder diesel engines. On the trials the fuel consumption of the main and auxiliary engines combined was 142.7 grams per i.h.p.

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Build Fast Motorships for South America

Particulars of the three motorships to be built by William Beardmore & Co. Ltd., at Dalmuir, for the Companhia Nacional de Navegascao Costeira, Rio de Janeiro, are as follows:

Length between perpendiculars ft. in.	370 0
Breadth molded, ft. in.	52 0
Depth molded, ft. in.	26 9
Mean draft (maximum) ft. in.	20 6
Deadweight in tons, about	3800
Speed on trial, knots	14½

The vessels are to be built to Lloyd's highest class 100A-1, with freeboard, and will have a straight stem, elliptical stern, one funnel and two pole masts. Above the upper deck the erections will consist of poop, promenade and forecastle decks, upper promenade deck and boat deck. They are to comply with British board of trade requirements with regard to sub-division, passengers and crew's accommodation, and life saving appliances, and also with the factory act regulations. The oil fuel is carried in the double bottoms forward of the machinery space and in deep tanks in wings abreast the auxiliary boilers, the total capacity being about 600 tons.

Passenger Accommodations

Accommodation is provided for 39 first class passengers in 13 state rooms on the upper deck and for 106 first class passengers in 36 state rooms including two cabins *de luxe* with bath and dressing rooms adjoining, on the promenade deck. The first class dining saloon with seating accommodation for about 125 persons is placed forward on the upper deck and will be tastefully decorated in polished hardwood and fitted with small tables and chairs for two, four, six and eight passengers. Above the dining saloon on the promenade deck is arranged the music room or lounge, access to which is provided by a large main staircase. This apartment will also be handsomely decorated and fitted with grand piano, tables, easy chairs and writing tables. The first class smoking room and verandah cafe are placed at the after end of the promenade deck and will be decorated and furnished in keeping with the other first class public rooms.

The intermediate passengers, 40 in number, are accommodated under the poop deck in four and six-berth cabins, with the dining saloon also under the poop deck and the smoking room on top of the deck.

There is accommodation for ninety third class passengers in nine compartments on the main deck forward, with large dining space.

Two compartments on the main deck, one forward of the machinery space for provisions, and one abaft the machinery space for the carriage of meat and fruit are installed and refrigerating machinery, fans and trunking are provided to keep these spaces at a suitable temperature. The total cubic capacity of the refrigerated chambers is about 20,000 cubic feet.

The vessels have three cargo holds forward of the machinery space and two cargo holds aft. Numbers 1, 3 and 5 cargo holds are served by one hatch each on the center line of the ship, and numbers 2 and 4 cargo holds by two side hatches each. Number 3 cargo hold is entirely sheathed with cross boarding for the carriage of salt. Ten hydraulic cranes are provided for dealing with cargo, eight of which are capable of lifting 30 cwts. each and two (serving number 2 holds) are of 3 tons lifting capacity. In addition to these cranes an electric warping winch is fitted aft on the poop deck and an electric boat hoisting winch is fitted on the boat deck, both of these having extended ends. A fire extinguishing machine and a steam disinfecting chamber are also provided.

Two steam-driven compound engines and dynamos will be fitted, each of about 110 kilowatts at 220 volts, to provide power for fans, and for lighting the ship. An emergency lighting set driven by a paraffin engine is also provided and fitted in the casing on upper promenade deck.

The steering gear is of the electro-hydraulic type, placed under the poop, and is controlled by telemotor from the navigating bridge. The windlass is steam-driven and of the direct-acting vertical type, with quick warping ends.

Main Propelling Machinery

The main propelling machinery consists of two Beardmore-Tosi single-acting four-stroke cycle engines of the same general design as those fitted by Messrs Beardmore to the motor ships PINZON, PIZARRO and SILURIAN, and under license from Messrs Beardmore to the M. S. SYCAMORE and TRAMORE by Richardsons Westgarth Co. These engines will follow the same broad principle in design which has worked so successfully in the above ships, but have incorporated in them a number of minor modifications toward simplicity and ease of access and overhaul resulting from successful experience with the previous ships.

These diesel engines, furthermore, will have the distinction of forming the first supercharged motor machinery to be built in this country. The advantage of supercharging in connection with the trade foreseen for these ships is of very considerable importance.

They will develop, when supercharged, a maximum of about 4750 indicated horsepower at about 140 revolutions per minute. Steam will be supplied for deck and for many of the engine room purposes from two oil-fired forced draft auxiliary boilers. All the pumps supplying the main engines are separately driven, some electrically and the remainder by steam. Most of the engine pumps supplying the main engines are electrically driven.

Twin Screw Motorship Chr. Knudsen

This motorship was built to the order of Messrs. Borgestad, of Borgestad, Norway and complies with the requirement of the Norwegian VERITAS, class L.A.L. 1923. The twin screw M.S. CHR. KNUDSEN is a single deck cargo vessel with poop, bridge and forecastle. Her principal particulars are as follows:

Length between p.p., ft., ins.	**380 0**
Breadth molded, ft., ins.	**54 6**
Depth to main deck, ft., ins.	**28 6**
Draft loaded, ft., ins.	**23 7¾**
Gross tonnage about	**4904**
Deadweight tonnage about	**8400**
Capacity in grain, cu. ft.	**450,100**
Capacity in bales, cu. ft.	**429,800**
Designed sea speed, knots	**10¾**

The ship is constructed with a double bottom extending the entire length of the hull, fitted partly for the carriage of water ballast and partly for fuel oil, with a capacity of 1538 tons of oil.

Cargo Handling and Quarters

There are ten 5-ton derricks which are served by eight 3-ton winches and two 5-ton winches. The two aftermost 5-ton winches are fitted with warping barrels. The winches are all electrically driven. The steering gear which was supplied by Brown Bros. is of the electro-hydraulic type and is controlled from the bridge by means of a telemotor. The windlass is of the Emerson Walker make and is electrically driven.

In the two deckhouses accommodation is provided for the ship's officers and a few passengers. The galley is also located here. On top of the forward deckhouse is the chart-room and the captain's quarters. The wireless cabin is fitted with a 1-kilowatt

(*Continued on Page* 44)

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Port Charges Are Too High

Expenses of a Ship Begin with the Pilot on Approach to the Harbor—Wharfage, Tug Service, Tallying, Stevedoring—All Take Their Toll

BY V. G. IDEN

NEW YORK is not only the most expensive port for a ship to visit of all the ports in the United States but probably the most expensive of all the ports in the world. It is claimed unauthoritatively that not only is New York the most expensive but that other American ports are not far behind, and American commerce is therefore unduly burdened by these unwarranted charges upon ships visiting our ports. For instance it is estimated that the expense of the port of New York is probably $2.50 to Boston's $2. Yet while the port of Boston may be somewhat cheaper in total charge the proportionate charge is more because not so large a volume of business is attracted to Boston and there is not as much freight or so many passengers among whom to prorate the port costs.

This situation has existed for years, but attempts have been and are still being made to correct the evil. One of these corrective influences is the Port of New York Authority. This body was created with the sanction of the legislatures of the states of New York and New Jersey for the purpose of co-ordinating the facilities of the port. It was given no authority to regulate port charges, and it is doubtful if either state would desire to delegate such authority. It is however a legal body that can investigate unreasonable charges and intervene before the proper authorities to bring about redress.

Berthing Space at High Cost

Excessive charges are particularly noticeable in connection with space at piers. This is a serious thing in the port of New York due to the great demand for pier space. At the present time it is impossible to lease a pier on the shore of Manhattan Island. All city piers are leased and a ship line is compelled to re-lease or re-re-lease from a present tenant. This situation not so long ago resulted in a near scandal which was called up for investigation and correction. And the next is the charge for lighterage. In one instance it was found that a pier company had leased space to a ship and then began levying wharfage charges on all lighters that brought freight to that ship alongside. This was a noted case in which the Port Authority intervened and was instrumental in having a decision rendered making it illegal to levy the double charge. These, however, are but sporadic instances where the Port Authority has attempted to bring about a correction of the port charge evil. Inasmuch as this body has been in existence for some time and since it has been able to effect reforms in but these few noted instances, it requires no great acumen to foresee how long it promises to take to bring down all the excessive charges to a level that the port should have.

A ship, it might be said, has the alternative of going to a pier in Brooklyn, or even to a pier on Staten Island. Port Newark is making a bid for the business by offering direct connections. For freight this is proving helpful as the growing business of the terminal proves, but it is inconvenient to passengers coming to New York to board vessels, and furthermore the largest ships cannot go up to the piers at Port Newark. The excessive charges at New York, consequently, have resulted from the fact that there is such a large demand for accommodations by the ships using the port and because the conveniences offered to meet that demand have for quite a while been inadequate.

Pilotage Charges at New York

Pilotage at the port of New York is conducted under authority of the state commissions of New York and New Jersey, and maintained through the Pilot association of New York and the Pilot association of New Jersey. There is also the Hell Gate Pilots association, operating through the East River, Hell Gate and Long Island Sound. The charges are based upon the draft of the vessel, varying from $2.78 per foot for inbound vessels and $2.02 per foot for outbound vessels which draw not over 13 feet, 6 inches of water. For vessels drawing 21 feet or more the inbound rate is $4.88 per foot and the outbound $3.56 per foot. Also from Nov. 1 to April 1, there is an additional winter pilotage fee of $4.00 extra for each pilotage. The Hell Gate rates are $1.75 per foot for sloops, schooners and barges, and $3.00 per foot for barks, ships, steam and motor vessels. Here there is also an extra winter pilotage between Nov. 1 and April 1 of $2 and $4 each.

Towage is a variable matter, resulting from the fact that there are many tow-boat companies and independently owned boats operating in the port. For docking or undocking a vessel, a towboat will cost from $22.50 per tug to $25 per tug on the East river, $30 per tug on Staten Island, Bayonne and Jersey City shores and New York Bay, and from $22.50 to $70 a tug on the North river, the charge varying according to the distance the tow is required. The smaller charge is when the tow is used for a distance equal to that between the Battery and points opposite Seventeenth street, Manhattan, the greater for a distance equal to that from the Battery to Yonkers. If still greater distances are necessary

Improve Port Services

Under present conditions the margin between profit and loss in the business of transportation by water is exceedingly narrow. In this article the high cost of port charges in the turn around of vessels in our principal ports is discussed. On the proposition that the laborer is worthy of his hire there can be no disagreement. To pay and to pay well for labor honestly and efficiently performed is a sound policy. But the real question is whether the quality and efficiency of the service could not be greatly improved so that more work would be done and the time in port reduced. This can and should be done in order to relieve the ship from too heavy a burden; thus improving business all around, by which everyone would benefit.

In another article soon to be published in MARINE REVIEW Mr. Iden will discuss, what at first thought at least, would seem to be, the vast amount of unnecessary red tape and paper work which all ships must go through at our ports. We seem to be ridden by tradition in this as in many other respects in the shipping business. Why not clean house?

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the charge may be made at the hourly rate of $12.50 per hour from the time of the departure of the tug until her return. The hourly charge is assessed for transporting vessels from dock to dock, anchorage to dock, or vice versa, with a minimum charge of $25 per tug. For shifting barges with lighters in and about the slips the charge is $10 per hour, minimum charge one hour. And for services in the bay, attendance with surveyors, clerks and ships officers to and from steamers in the bay, the rates are $12.50 per hour, with a minimum charge one hour. Detention is charged for at the rate of $12.50 per hour, which is also the charge for services of tugs supplying steam. In addition to these, charges may be assessed at one and one-half rates for Sundays and holidays, and an additional charge of $6.25 per hour for waiting or services before 7 a.m. or after 5 p.m. Special mileage zone rates are assessed on all classes of sailing vessels and coast barges.

No Uniform Rates for Piers

Dock charges vary entirely according to the contract which it is possible to make. The dockage rate at public piers is per net registered ton on the basis of 4 cents per ton for the first 200 tons and 1 cent per ton for the balance, for each 24 hours or fraction thereof. But most piers are leased to shipping companies, and dockage at such independently operated piers is charged for and rates are assessed at the option of the owner or lessee. No uniform rates exist, and the day rates depend on local conditions, supply and demand. The rate charged includes so much length in lineal feet of berthing space for vessel and so many square feet of area on the wharf, corresponding usually with the length agreed upon for cargo purposes. To all intents and purposes this space becomes the property of the renting party for the time of his tenancy, which may be a period of days, weeks or months. So much per day is usually charged, and the rate depends wholly upon local conditions. The charge may range from $100 to $250 per day. An ordinary berth would be about 400 feet to 500 feet in length and the width would vary with the physical aspect of the pier, but might range from 80 feet to 150 feet.

Storage is covered in the tariffs of the railroads on through freight. In rare cases free time storage is allowed, and owing to the competition between lines, the arbitrary storage of cargo is the exception rather than the rule. In case the cargo is not removed at the time specified it is usually removed from the pier and stored in a public warehouse.

The stevedores in the port of New York are 100 per cent unionized, and the regular union rates apply. There are a number of stevedoring companies and some steamship lines maintain their own organizations, but there is no uniform schedule of stevedore rates published. The stevedores work on an 8 hour day and 48 hours a week, and the daytime regular wage is 80 cents per hour, during meal hours and on Saturday afternoons during the summer the rate is $1.20 per hour. From midnight to 1 a.m. and from 6 p.m. to 7 p.m. the rate is $2.40 per hour They charge a special rate of 25 cents per hour for handling bulk cargoes, such as ballast and coal, and an overtime of $1.25 per hour. They charge 95 cents per hour for handling wet hides with an overtime of $1.35, and for handling kerosene, gasoline and naptha in cases they charge $1.00 per hour with an overtime of $1.50 per hour.

Tallymen obtain $8 per day, extra men in the office $7 each, and checkers $6. They get an overtime of $1.20 per hour and are paid at the same rate for working during fixed mealtimes. The overtime rate is double when the work is between the hours of midnight and 1 a.m. and between 6 a.m. and 7 a.m. All these rates are plus compensation insurance of 1¼ per cent plus a differential of 10 per cent. Cargo repairmen are paid 90 cents per hour with an overtime of $1.50 per hour.

It is estimated that, based upon a charge for labor of 80 cents per hour, the discharging rate per ton for bricks, for instance is $2.00; $2.15 per ton for a commodity such as bones; $1.08 for tin plates, or 12½ cents per box or barrel for fruit or grapes. For loading bag grain, per 1000 bushels, full cargoes, the rate would be $16.50, whereas general cargo would be loaded for about $1.11 per ton. Overtime and other extras are not figured into these estimates.

Facilities at the outports vary according to conditions, and it takes a combination of these conditions to regulate the comparative expense of the ports in question. It cannot be denied that New York is a very expensive port, but it is an expeditious port—as a matter of fact if the freight did not move rapidly through the port the charges accruing would be prohibitive as can be readily seen from the rates of charges mentioned. At some of the outports the port charges are less but the delay on the dock is greater and storage charges must be assessed.

For excessive charges the rates at Boston have been cited by practical steamship men. The pilotage at that port, for instance varies from $3 per foot draft for vessels under 501 tons in size, to $5 per foot draft for vessels measuring over 2000 tons. Wharfage there is assessed on cargo by the railroads when they do not obtain the line haul on it at a rate varying from 30 to 50 cents per ton. Per diem moorage will vary from $10 to $20. Stevedoring will cost from about 94 cents per barrel on asphalt to $2.30 per ton on case goods. The stevedoring cost on grain is about 2½ cents per bushel, and on coffee a little better than 8 cents per bag.

Following is an estimate of what it would cost a 3500 net ton ship to visit Boston, assuming that 65 per cent of the cargo is taken from the pier by truck or teams for which an average charge may be 40 cents per ton; 35 per cent of the cargo is taken from the pier, for which a charge of 10 cents per ton is made for wharfage, which is railroad wharfage, as applied to state piers. Stevedore charges would average $1.25 per ton.

Two tugs assisting to berth	$ 40.00
Electricity (winches and lighters)	100.00
Water	25.00
Wharfage on cargo (by truck)	910.00
Wharfage on cargo (by rail)	122.50
Stevedore (variable)	4375.00
Two tugs assisting out	40.00
Wharfage tonnage (variable)	100.00
Total	$5712.50

Pilotage at Other Ports

As a basis of comparison the pilotage rates at other ports may be considered, and while these give some light on the relative expense of a port they are not final by any means. At Philadelphia the pilotage charge will vary from $32.20 inward for vessels drawing 8 feet to $159.50 when drawing 29 feet, and outward from $32.00 to $145.00. At Wilmington, N. C., the pilotage is $17.22 when the draft is 6 feet and $431.02 when the draft is 30 feet. At Hampton Roads the pilotage varies from $2.50 per foot for 8 foot draft to $5.00 per foot when 20 feet draft or over. At Jacksonville the pilotage is from $12.00 for 6 foot draft up to $174.00 for 29 foot draft. At Mobile the rate is $22.50 for 9 foot draft up to $135 for 22½ foot draft. At Galveston the charge is $3 per foot draft for a 500-ton vessel, varying up to $4.00 per foot draft for vessels over 1500 tons in measurement. At New Orleans river pilotage costs $2 per foot draft, and bar pilotage $4 per foot

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River, Harbor, Lake and Ocean Vessels Are Illustrated and Described

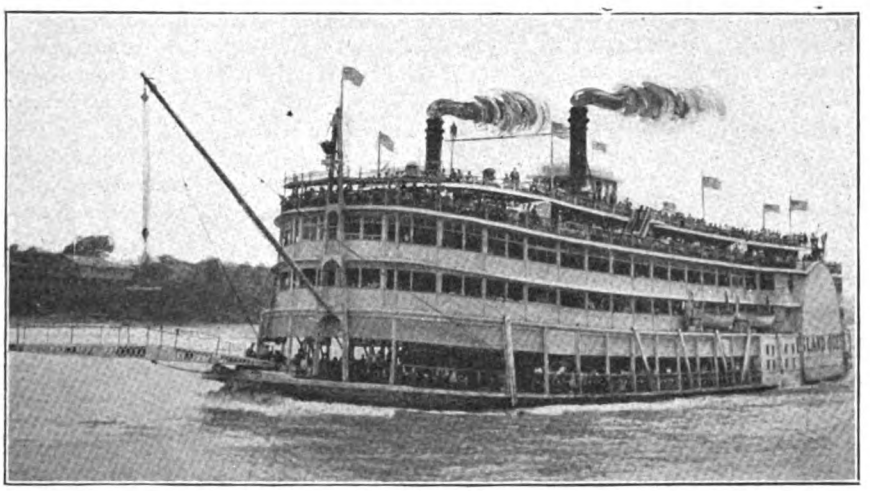
IN THE United States domestic requirements for transportation by water is constantly growing and cannot help but continue to grow. The number and diversity of specialized craft needed to meet the peculiar problems of widely varied localities and services call for the application of naval architecture and marine engineering in many interesting and novel ways.

On the great inland waterways of the country, serving large and prosperous industrial sections, there is an awakening to the vast possibilities of cheap transportation by means of modern vessels. For new vessels, steel has replaced wood for nonpropelled barges, for towboats and for passenger vessels. The problem of shallow draft must be solved. Propulsion by paddle or stern wheels, as old as the history of river navigation, is still universally the accepted mode; but experiments have been made and a number of successful boats with screw propellers working in tunnel sterns have been built. There is a constantly growing tendency to depart from the uneconomical single and compound steam engine and to adopt the diesel and diesel electric for propulsive power. Further education, and successful experience with boats now so engined will have a powerful effect in bringing about a complete transformation of river boat types along this line.

With steadily increasing overseas, intercoastal and coastwise commerce there will be need of a corresponding increase in harbor craft, in tugboats, lighters and floats. Many communities are so separated by water that the easiest and most economical if not the only means of communication is by boat. It is very noticeable that passenger and vehicle and car ferries are being built in greater numbers today than ever before. More vessels are needed and are being built to carry the growing commerce of the Great Lakes.

On account of the great fleet of cargo carriers built during the emergency of war little or no new building of this type has yet been called for but there is a steady if slow tendency toward economy of operation by converting existing steam vessels to diesel drive. On this and accompanying pages the following new and converted vessels are illustrated and concisely described, river passenger boat Island Queen, river towboat Georgia, harbor tugboat Stroudsburg, passenger ferries American Legion and York, self unloading lake freighter Charles C. West, tanker Lio and ocean freighter East Indian both of the latter converted from steam to diesel drive.

ISLAND QUEEN--River Passenger--Side Paddle Wheel--Steam



DESCRIPTION

The side paddle wheel river passenger steamer, ISLAND QUEEN, built for the Coney Island Amusement Co. by the Midland Barge Co., is one of the finest vessels for her service on the Ohio and Mississippi rivers. The passenger capacity is 5502 as an excursion vessel and a crew of 70 is carried. She is mainly an excursion boat.

Name—ISLAND QUEEN.
Owner—Coney Island Amusement Co.
Builder—Midland Barge Co.
Naval Architect—Thomas Dunbar.
Launched—1924.
Completed—April, 1925.
Classification—River excursion.

HULL PARTICULARS

Length overall, 300 feet; length between perpendiculars, 290 feet; breadth molded of hull, 45 feet 6 inches; breadth overall, 83 feet; depth molded, 12 feet; draft, 5 feet; deadweight tonnage, 1000; gross tonnage, 1000; net tonnage, 800; passenger capacity, for excursions, 5500; crew, 70; speed, 20 statute miles per hour.

MACHINERY PARTICULARS

Main Engines—Two, Tandem compound Western river type, built by Charles Barnes Co.; size 22 x 40 inches and 9 feet stroke; connected directly to the paddle wheel shaft.

Boilers—Six, Western river type, with 10 flues; size, 44 inches x 24 feet; built by the Acme Boiler Works; fuel, oil.

AUXILIARY EQUIPMENT

Manufacturers of:
Oil Burning Equipment—Hagen.
Electric Generators—Westinghouse.

The day of the palatial river steamers on the Ohio and Mississippi seems to be returning. The ISLAND QUEEN, similar in dimensions, machinery and general arrangement to the steamer CINCINNATI, has the distinction of being the only all-steel fuel oil burning vessel on western rivers, according to the owners. The passenger capacity as an excursion boat is the largest on board of any vessel registered under the American flag. This boat is in use on excursions and may also be used on the longer runs from Cincinnati down the Ohio and Mississippi to New Orleans and way ports.

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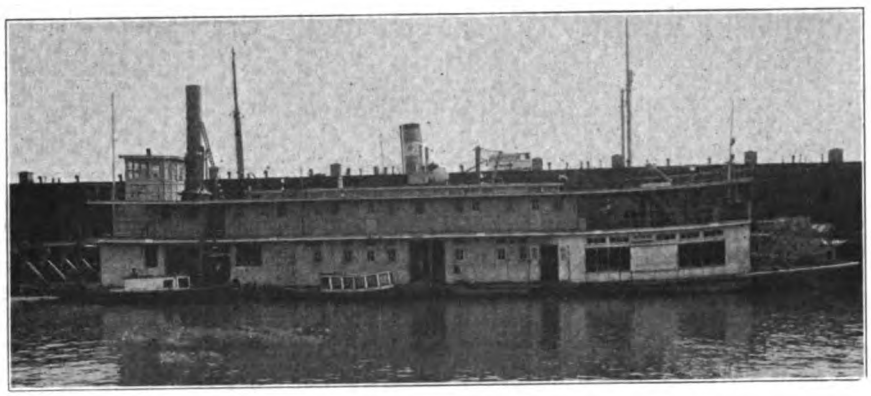
GEORGIA--River Towboat--Stern Wheel--Steam



DESCRIPTION

This steel stern wheel towboat is now in use for general towing purposes in connection with the improvement of the Chattahoochee and Apalachicola rivers in Georgia, Florida and Alabama, being carried out under the direction of the United States Engineering department, Montgomery, Ala.

Name—GEORGIA.
Owner—United States Engineers.
Builder—Charleston Dry Dock & Mach. Co.
Naval Architect—United States Engineers.
Launched—Feb. 24, 1925.
Completed—November, 1925.
Classification—Stern wheel river towboat.

HULL PARTICULARS

Length overall, 153 feet 4½ inches; length between perpendiculars, 134 feet; breadth molded, 30 feet; depth molded, 4 feet 6 inches at sides with a camber of 4 inches in 30 feet; draft, 3 feet 2½ inches; displacement loaded, 310 tons; sheer forward and aft at center lines, 6 feet; bunker fuel capacity in tons of coal, 36; speed, 7 statute miles per hour.

MACHINERY PARTICULARS

Main Engines—Two simple high pressure Joy valve steam engines of 13-inch diameter and 60-inch stroke; built by the Charleston Dry Dock & Machine Co.

Boilers—One cross drum water tube boiler, made by the Wickes Boiler Co., Saginaw, Mich.; heating surface, 1610 square feet; working steam pressure, 250 pounds per square inch; superheat, 150 degrees; fuel, coal. Auxiliary boiler of vertical submerged type, 70 square feet heating surface, pressure 25 pounds per square inch; built by Charleston Dry Dock & Machine Co.

AUXILIARY EQUIPMENT

Manufacturers of:
Pumps—M. T. Davidson Co.
Capstan—Hyde Windlass Co.
Gypsies—Hyde Windlass Co.
Steering Engine—Dake Engine Co.
Feed Water Filter—International Filter Co.
Feed Water Heater—Davis Eng. Corp.
Portable Water Still—Davis Eng. Corp.
Refrigeration—Audiffren Ref. Machine Co.
Superheaters—The Superheater Co.
Induced Draft—B. F. Sturtevant.
Soot Blowers—Diamond Power Specialty Co.
Electric Generators—Langstadt-Meyer Co.
Storage Batteries—56 cell 150 amp. hour.

It is interesting to note from the detailed specifications for this type of boat, that the United States engineers directed that she should be built of scantlings equal to American bureau of shipping rules unless otherwise specified and that the longitudinal system of framing should be adopted. The stern is of forged iron or cast steel 1½ x 5 inches and extends from the main deck to frame, 59. The transom is of ⅜-inch plate, rounded to a radius of 2 feet 7 inches. The deck angle is 3 x 3 x 5/16 inches while the stiffeners are 2½ x 2½ x ¼ inch angles. The side plating is of ¼ inch thickness as is the bilge plating and the bottom plating of center line, while elsewhere the bottom plating is 3/16-inch thick, except at the forward end where it is ¼ of an inch. Doubling plates are called for at all openings of the hull. The regular length of plates is not less than 20 feet, except at ends. Floors in the boiler well are ¼-inch plate and are fitted intercostal between center line keelson and the wing bulkheads.

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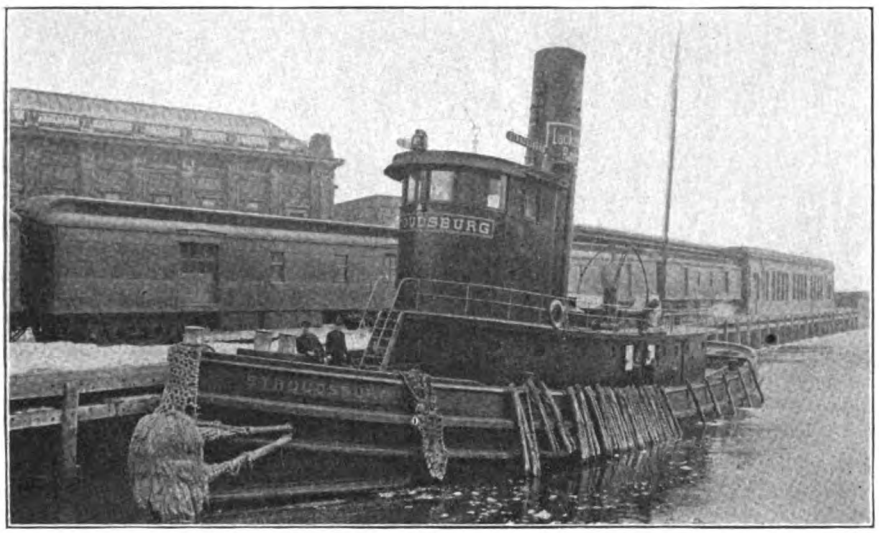
STROUDSBURG--Harbor Tug--Single Screw--Steam



DESCRIPTION

The tug boat STROUDSBURG and sister tug NEWTON are two powerful tugs built to the requirements of the Delaware Lackawanna & Western railroad. They are almost unique nowadays for new tugs in that they have steam engines and burn coal. The hulls and machinery have been constructed by companies long experienced in this type of work. In design the tugs are the usual New York harbor type.

Name—STROUDSBURG.
Owner—D. L. & W. Railroad
Builder—Beth. S. B. Corp., Harlan Plant
Launched—Sept. 19, 1925
Completed—Jan. 5, 1926
Sister Tug—Newton, launched Nov. 4, 1925; completed Jan. 19, 1926

HULL PARTICULARS

Length over all, 100 feet; length between perpendiculars, 93 feet 6 inches; breadth molded, 25 feet; depth molded, 13 feet 3 inches; draft, 11 feet 6 inches; gross tonnage, 195; net tonnage, 133; coal bunker fuel capacity in tons, 30; speed, 12 miles.

MACHINERY PARTICULARS

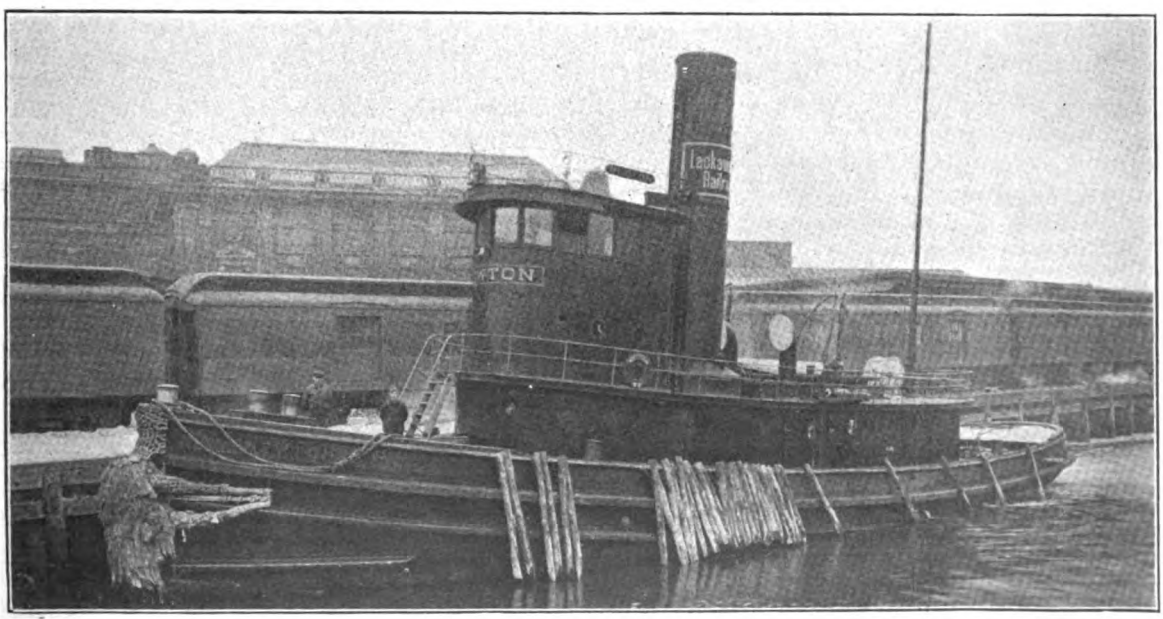
Main Engine—One compound condensing, size 18 x 40 x 28 inches; built by John W. Sullivan Co.; horsepower, 1000.

Boilers—One three furnace single ended Scotch type, 175 pounds per square inch working pressure; size, 12 feet long x 14 feet 6 inches diameter; built by Beth. S. B. Corp., Harlan plant; fuel, coal.

AUXILIARY EQUIPMENT

Manufacturers of:
Pumps—Worthington Pump & Mach. Co.
Steering Engine—American Eng. Co.
Propellers—John W. Sullivan Co.
Electric Generators—General Electric Co.
Vehisote—The Pautasote Co., Inc.

Both hull and superstructure are built of steel. There is one double compound condensing steam engine of 1000 horsepower. Each tug is equipped with an underwriter's fire and wrecking pump of 1500 gallons per minute capacity and with a water tower on the pilot house and six hose connections on the main deck. This tug is capable of towing two steel car floats loaded with 21 cars each, at a speed of 8 to 9 miles per hour.



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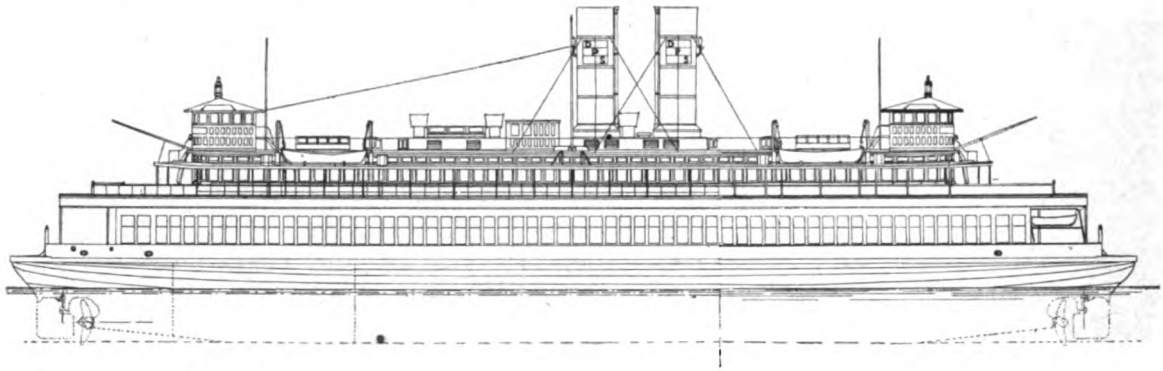
AMERICAN LEGION--Ferry--Double Ended--Screw Steamer



Name—AMERICAN LEGION
Owner—City of New York
Builder—Staten Island Shipbuilding Co.
Naval Architect—R. W. Morrell
Launched—Under construction.
Classification—American Bureau of Shipping, A-1 (E) ferry service

HULL PARTICULARS

Length overall, 264 feet; length between perpendiculars, 224 feet 6 inches; breadth molded, 47 feet; depth molded, 20 feet 2 1/8 inches; draft, 12 feet 6 inches; displacement loaded, 1786 tons; gross tonnage, approximately 2600; net tonnage, approximately 1700; passenger seating capacity is 1650; automobile capacity is 32; bunker fuel oil capacity in tons, 110; speed estimated, 18 statute miles per hour.

MACHINERY PARTICULARS

Main Engines—Two double compound condensing 22½ x 50 inches diameter of cylinders and 30-inch stroke; about 4000 indicated horsepower; built by Staten Island Ship Building Co.

Boilers—Four, built by Babcock & Wilcox Co.; marine water tube type of 14,308 square feet of total heating surface; working pressure, 225 pounds per square inch; fuel, oil; forced draft by means of two turbine-driven blowers; oil burners will be fitted with a variable control system to regulate the steaming while in the slip.

AUXILIARY EQUIPMENT

Manufacturers of:
Pumps—Worthington
Heaters, Feed Water—Davis Eng. Corp.
Fire Extinguishers—Bethlehem S. B. Corp.
Blowers—B. F. Sturtevant Co.

DESCRIPTION

A double decked double ended ferry boat with two team gangways and two passenger cabins, one on each side of the main deck. Recently ordered, and is the latest ferry boat for the City of New York. This boat is designed to maintain the regular schedule between Manhattan and Staten Island, but will have more reserve speed and power than the present ones. The propelling machinery consists of two vertical compound steam engines coupled together and driving a cast steel propeller at each end.

The team gangways are divided by a center house enclosing the machinery. There is an upper saloon deck with accommodations for passengers only. The hull and the superstructure up to the saloon deck are built of steel. The hull is divided into six watertight compartments, comprising an engine room, boiler room, two peak compartments and two hold compartments. Oil for fuel is carried in four separate tanks independent of the hull, all of about the same capacity, two in each end of the vessel.

There is installed the usual engine room auxiliaries in the engine room. The fuel oil pumps, fuel oil heaters and strainers together with forced draft blower equipment is installed in the boiler room. There is an independent stack and funnel for the forward pair of boilers and another independent stack and funnel for the after pair of boilers.

In addition to the fire fighting and extinguishing equipment called for to meet the requirements of the United States steamboat inspection service, there is also installed in the fire room a navy type Amdyco 40-gallon steam-operated foam fire extinguisher unit with attached hose. All the machinery and equipment is of the very latest type, and fireproof construction has been followed throughout.

It is said that this new ferry boat will be the largest and finest in the world and that it should be ready for service late this coming summer. While the AMERICAN LEGION is similar to the PRESIDENT ROOSEVELT, many improvements have been incorporated. One particularly deserves mention. Where the deck projects over the hull proper, the frames have been shaped and the shell plating presents a continuous curved line, avoiding the use of braces which were subject to damage and also materially increasing the stability. The new design also provides for an overhang at each end which will tend to keep the forward deck dry in rough weather and will also lessen the damage from ice accumulating on the deck by the freezing of water thrown over the bow.

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YORK--Ferry--Double Ended--Screw--Diesel

DESCRIPTION

A steel hull double ended screw ferry for vehicle and passenger service between Gloucester Point and Yorktown, Va., connecting two main highways. Passengers are accommodated in a house on the upper deck. The lower deck is used for vehicles and will carry from thirty to thirty-five motor cars.

Name—YORK.
Owner—W. T. Ashe.
Builder—Spedden Shipbuilding Co., Baltimore.
Naval Architect—Eads Johnson.
Launched—Aug. 19, 1925.
Completed—Sept. 4, 1925.

HULL PARTICULARS

Length overall, 115 feet; length between perpendiculars, 92 feet 10 inches; breadth molded, 33 feet; depth molded, 12 feet; draft loaded, 6 feet 6 inches; displacement loaded, 260 tons; gross tonnage, 260; net tonnage. 177; speed, 10 knots; bunker fuel capacity, 2000 gallons.

MACHINERY PARTICULARS

Main Engine—One 240-horsepower Fairbanks-Morse diesel engine, clutch connected to one propeller forward and one aft.

AUXILIARY EQUIPMENT

Manufacturers of:

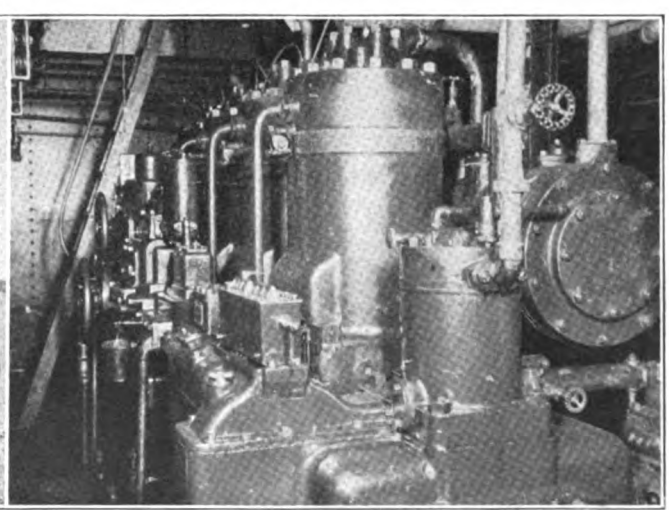
Pumps—Fairbanks-Morse.

Electric Generator—Fairbanks-Morse.

Auxiliary Oil Engine—15 horsepower; Fairbanks-Morse.

The illustrations above and below show quite clearly the type of this ferry. It is an interesting example of how the diesel engine can solve the problem of the double end drive, by clutch connection between the propellers and the engine. Considerable maneuvering time is saved in making landings and in getting away on the return trip, by this means. The YORK is owned and operated by W. T. Ashe, of Gloucester Point, Va., and replaced a smaller boat powered with a 60-horsepower Fairbanks-Morse "CO" engine. The diesel drive was decided upon after a thorough investigation of various types of engines and methods of application. In this case economy in fuel consumption and the saving in wages of crew reduces the cost of operation as compared with an equal sized steamboat.

The hull is constructed of steel, with a wooden main deck supported by fore and aft steel trusses and two rows of stanchions. There is an upper deck and house for passengers. The contract was signed on March 28, 1925, and the keel was laid on May 18.



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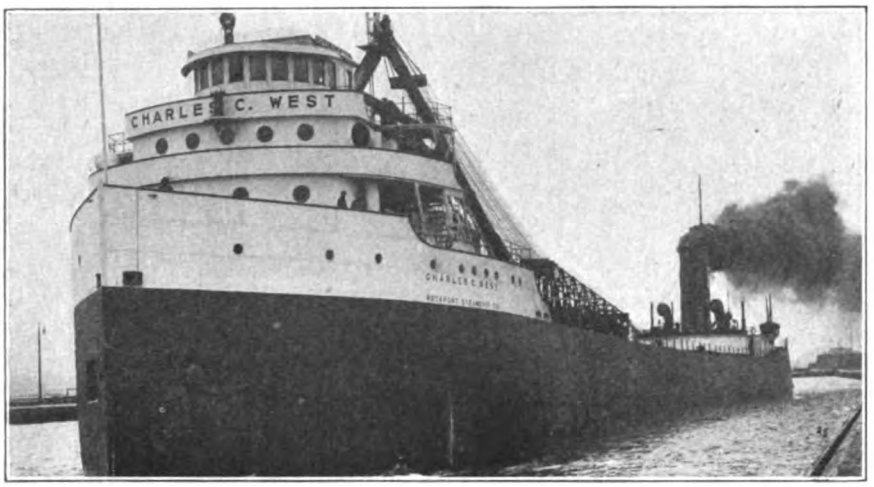
CHARLES C. WEST--Self Unloader--Twin Screw--Steam



DESCRIPTION

A self unloading Great Lakes bulk freighter built by the Manitowoc Shipbuilding Corp. for the Rockport Steamship Co. In hull dimensions this vessel is somewhat smaller than the standard Great Lakes freighter. In her propulsive machinery she differs in that she has twin screws. She represents a type which is becoming increasingly important.

Name—CHARLES C. WEST.
Owner—Rockport Steamship Co.
Builder—Manitowoc S. B. Corp.
Naval Architect—Manitowoc S. B. Corp.
Launched—July 8, 1925.
Completed—Sept. 21, 1925.
Classification—American bureau of shipping.

HULL PARTICULARS

Length over all, 470 feet; length between perpendiculars, 450 feet 2 inches; breadth molded, 60 feet; depth molded, 31 feet; draft, 20 feet; displacement loaded, 14,700; gross tonnage 6645; net tonnage, 5004; cargo capacity, 9000 tons stone; cargo capacity in cubic feet, 315,000; bunker fuel capacity in tons of coal, 325; speed, 11 miles.

MACHINERY PARTICULARS

Main Engines—Two triple expansion; size 17½ x 28½ x 48 inches x 36-inch stroke; 1000 horsepower each; built by Manitowoc Shipbuilding Corp.

Boilers—Three Scotch marine type; size, 13 feet in diameter by 11 feet 6 inches; 190 pounds per square inch working pressure; built by Manitowoc Shipbuilding Corp.; fuel, coal.

AUXILIARY EQUIPMENT

Manufacturers of:

Pumps—Dean Bros.
Windlasses—Wheland Co.
Steering Engine—Manitowoc S. B. Corp.
Refrigeration—Brunswick-Kroeschell.
Electric Generators—Two Engberg, 25 kilowatt.

The twin screw self-unloading steamer CHARLES C. WEST represents the development on the Great Lakes of an interesting self-contained type of vessel. The ordinary Great Lakes bulk freighter is loaded ordinarily, through chutes and takes its cargo to the plant of some steel company located within access by water, or to a rail terminal. In either case extremely efficient machinery exists for unloading these ships in the quickest possible time. The same applies to the discharge of coal cargoes at the northern ports. As a matter of fact the ship itself does not need to worry about unloading.

However other materials than coal and ore are beginning to become factors in the bulk cargo movement. The stone trade, for instance, on the Great Lakes, has been growing steadily and has now reached proportions where it is an item to reckon with and so has the cement trade. In ships designed more or less primarily for this trade it has been found of great value to have the ship self-contained so that it could unload itself wherever and whenever it liked. The CHARLES C. WEST is equipped with two triple expansion engines, each of about 1000 horsepower and in addition there is one triple expansion engine of 450 horsepower to run the conveying machinery. The steamer is named after Charles C. West, president of the Manitowoc Shipbuilding Corp. and was built for the Rockport Steamship Co. of which Peter Reiss, Sheboygan, Wis., is president.

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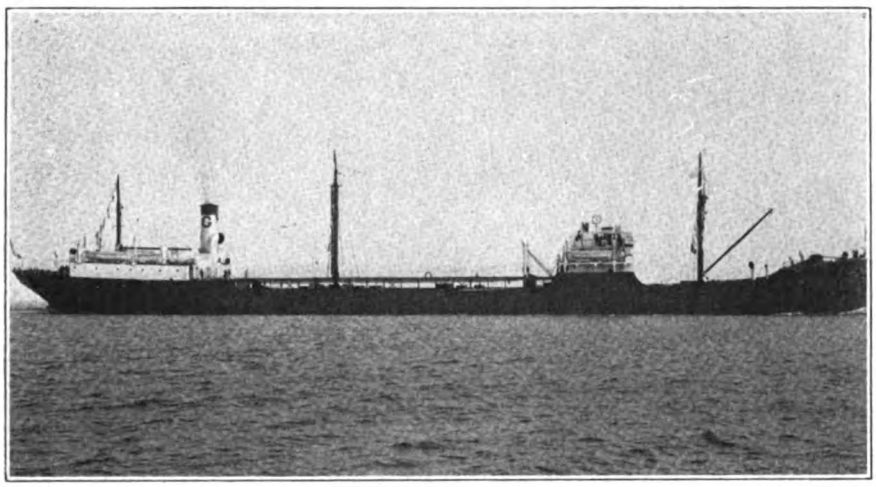
LIO--Tanker--Converted to Diesel Drive



DESCRIPTION

The tanker LIO, built in 1920 for the shipping board and fitted with Scotch boilers and geared turbines of 2800 horsepower, has been converted to diesel engine drive at the Union plant of the Bethlehem Shipbuilding Corp. A single diesel engine of 2900 shaft horsepower of the Bethlehem type has been installed.

Name—L10
Owner—General Petroleum Corp.
Builder—Baltimore D. D. & S. B. Corp.
Converted by—Beth. S. B. Corp., Union plant
Completed—(Built) in 1920
Converted—1925
Classification—American bureau

HULL PARTICULARS

Length over all, 450 feet; length between perpendiculars, 430 feet; breadth molded, 59 feet; depth molded, 33 feet 3 inches; draft, 25 feet 4½ inches; displacement loaded, 14,760 tons; gross tonnage, 7120; net tonnage, 4351; cargo capacity, 10,000 tons; cargo capacity cubic feet, 399,250 in main tanks; 57,500 cubic feet in summer tanks; bunker fuel capacity in tons, 1420; special loaded, 10½ knots.

MACHINERY PARTICULARS

Main Engine—One two-cycle 6-cylinder single acting diesel; bore, 27 inches; stroke, 60 inches; built by Bethlehem Shipbuilding Corp., Union plant.

Boiler—One fire tube Scotch marine type, built by Baltimore Shipbuilding & Drydock Co.; fuel, oil

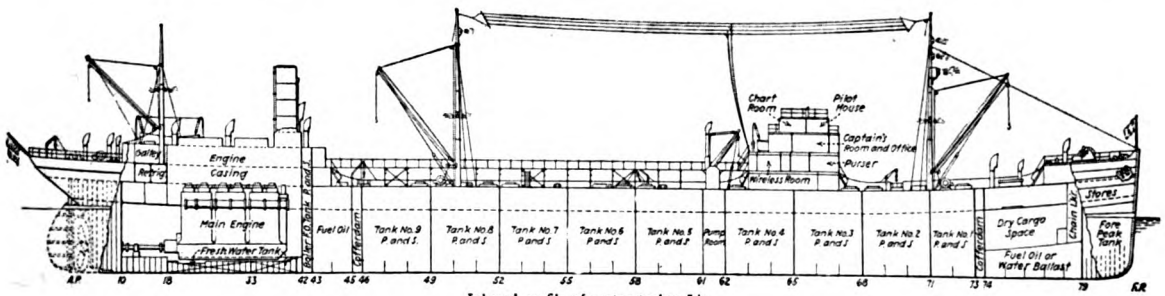
Auxiliary Oil Engines—Three, 100 brake horsepower, Bethlehem, Union plant.

AUXILIARY EQUIPMENT

Manufacturers of:
Pumps—Bethlehem-Weir
Windlasses—Allan Cunningham (Electric)
Winches—Original.
Steering Engine—Bethlehem S. B. Corp.
Propellers—Bethlehem S. B. Corp.
Refrigeration—Brunswick-Kroeschell
Oil Burning Equipment—Bethlehem
Electric Generators—Westinghouse
Thrust Bearing—Kingsbury
Radio Compass—Kolster
Gyro Steerer—Sperry
Oil Separators—Sharples
Air Compressor & Generator—Mianus

This vessel was originally built by the Bethlehem Shipbuilding & Dry Dock Co., now the Baltimore plant of the Bethlehem Shipbuilding Corp., in 1920. She was then fitted with geared cross compound turbines of 2800 shaft horsepower. Steam was supplied by three Scotch boilers. The General Petroleum Corp. purchased the vessel from the shipping board and then entered into a contract with the Union plant of the Bethlehem Shipbuilding Corp. at San Francisco for the removal of the steam propelling machinery and the installation of a Bethlehem diesel engine of 2900 brake horsepower.

One of the original main boilers has been retained and will furnish steam for operating the cargo pumps and winches and for heating. The vessel is to be used for carrying refining oil and gasoline from San Pedro to Great Britain and will be very economical.



Inboard profile of motor tanker Lio

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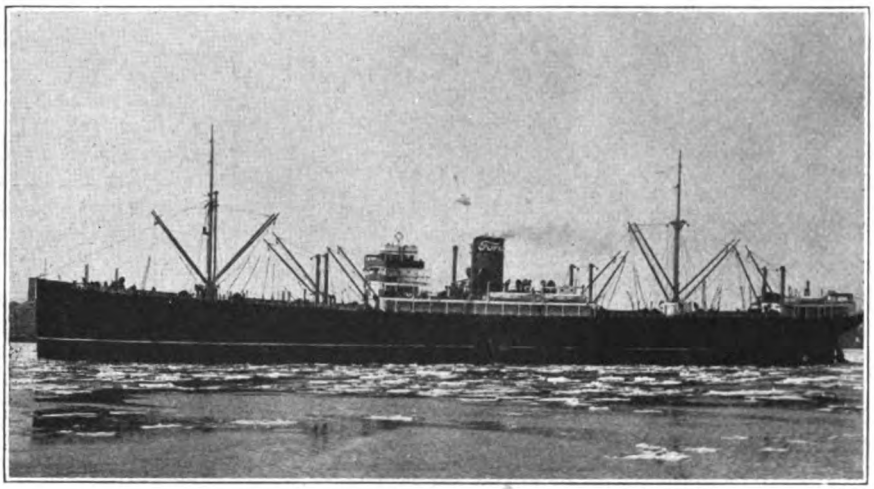
EAST INDIAN--Freighter--Converted to Diesel



DESCRIPTION

The EAST INDIAN was originally built with steam reciprocating engines in Japan for the shipping board. She has been converted to a modern twin screw diesel vessel by the Sun Shipbuilding & Drydock Co. There are no less than 19 booms served by 16 steam winches and two electric winches. She is intended for overseas trade and is now on her first voyage to European ports.

Name—EAST INDIAN.

Owner—Ford Motor Co.

Builder—Urago Dock Co., Japan, in 1918. Reconditioned and converted to twin screw diesel engine drive by Sun Shipbuilding & Drydock Co.

Naval Architect—John W. Hudson

Classification—Lloyds & American Bureau

HULL PARTICULARS

Length over all, 460 feet; length between perpendiculars, 445 feet; breadth molded, 58 feet; depth molded, 40 feet; draft 28 feet 6½ inches; displacement loaded, 16,350 tons; gross tonnage, 8159; net tonnage, 5160; cargo capacity cubic feet, 583,657; bunker fuel capacity in tons, 1000; speed, 12½ knots loaded at sea.

MACHINERY PARTICULARS

Main Engines—Two, Sun Doxford opposed piston, oil engines; size 21½ inches x 85 inches combined stroke; 4-cycle, 2500 shaft horsepower each at 90 revolutions per minute; built by Sun Shipbuilding & Drydock Co.

Boiler—One Scotch marine type, built by Urago Dock Co., Japan; fuel, oil.

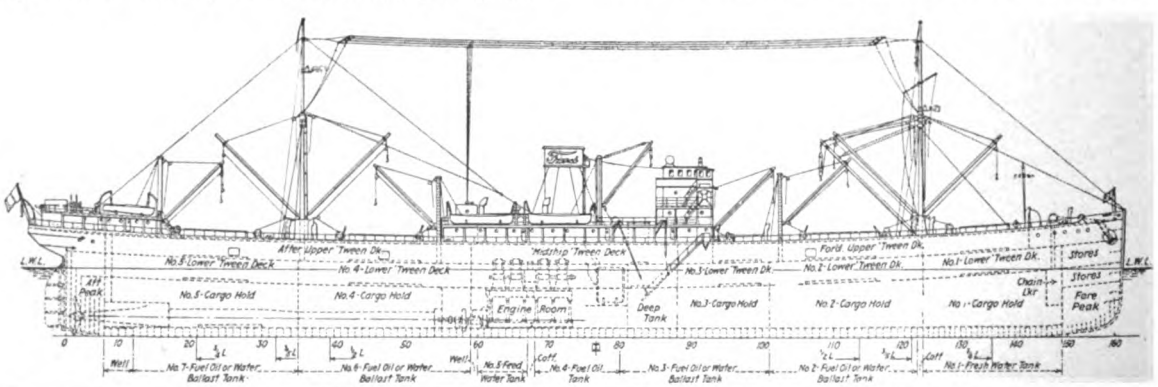
Auxiliary Oil Engines—Two Worthington, 225 shaft horsepower, cylinder diameter 15¼ inches by 16-inch stroke; 325 revolutions per minute.

AUXILIARY EQUIPMENT

Manufacturers of:

Pumps—Kerr & Union Steam Pump
Windlasses—Foreign make
Winches—Foreign make
Steering Engine—American Engineering Co.
Propellers—Harland & Wolf
Winches—Lidgerwood & G. E.
Refrigeration—Brunswick-Kroeschell
Oil Burning Equipment—White Eng. Corp.
Electric Generators—Crocker Wheeler
Oil Purifiers—DeLaval Separator Co.
Forced Draft—B. F. Sturtevant Co.
Electric Motors—Westinghouse
Gyro Pilot—Sperry
Gyro Compass—Sperry
Evaporator—Griscom Russell

The EAST INDIAN was formerly owned by the United States shipping board and was sold to the Ford Motor Co. to be used for carrying Ford products. In converting this vessel to diesel drive no half-way job was done. All the original accommodations were completely removed and redesigned. The vessel has a large continuous deck house amidships in which are located accommodation for deck and engine room petty officers, the galley, and a handsome saloon fitted up in polished oak. Above this deck house is situated another large deck house for the accommodation of owner and guests.



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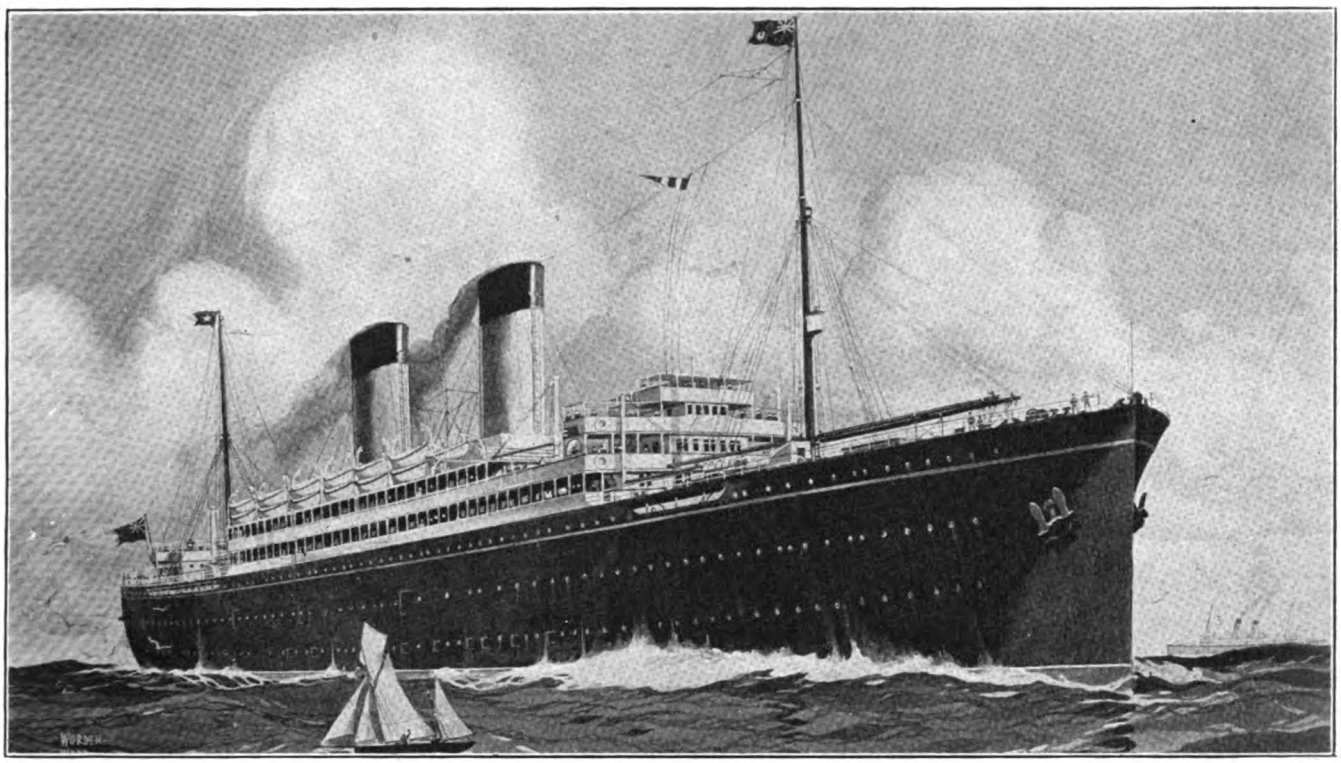
New Liner for Canada Service

S. S. Laurentic Building at Belfast Will Be Launched Next October—Ready for Service in Spring of 1927



From a painting by Worden Wood—the new transatlantic liner S. S. LAURENTIC—under construction at Belfast by Harland & Wolff—Intended for the White Star Line Canadian service— will be the largest cabin carrier between Montreal and Liverpool

THE steamship LAURENTIC, under construction at Belfast, Ireland, for the White Star Line Canadian service, to be launched in October next and placed on the Montreal-Liverpool route in the spring of 1927, is the largest and latest exponent of a transatlantic type that has come into vogue since the close of the War.

Not only will the new LAURENTIC—the second of the name—be the largest ship in the Canadian fleet of the White Star Line, which already includes two outstanding examples of this new type of liner, the REGINA and the DORIC, but she will be the largest cabin steamer in service to Canada.

Built to the limit of dimensions practicable for navigation of the St. Lawrence river, the new vessel is 604 feet long and 75 feet wide and will register 18,700 gross tons. Her displacement, will be 26,250 tons. She will have capacity for 600 cabin and 1000 third class passengers.

Bearing strong resemblance to her sister ships in the Canadian trade, and also to the PENNLAND of the Red Star Line, the LAURENTIC will be wider than any of her class by several feet and hence will have greater deck space, a valuable asset in a ship devoted primarily to the tourist passenger business.

In general arrangements the new ship will have, besides the usual accommodation, all the newer features accepted as standard in the modern cabin liner, such as verandah cafe, sports deck, gymnasium, children's playroom and rooms in suites consisting of private sitting room, bedroom and bath. There are six of these suites on B deck in the choicest location amidships, and they will be furnished, like the rest of the ship, in a style that a few years ago would have been looked for only in express liners.

Has Attractive Accommodations

Practically all the ordinary staterooms have outside light and air, and will be equipped for hot and cold running water. Public rooms in the LAURENTIC, as in her sister ships, are spacious. They will be handsomely decorated, the smoking room in natural woods, and the lounge and dining saloon in white and light tints. There will be 310 seats in the dining saloon, at tables for four, six or eight people, a convenient grouping.

The new ship will have exceptionally attractive third class quarters, specially fitted to meet the requirements of tourist traffic. There will be three dining saloons, a ladies' room, a lounge, a general room, two smoking rooms, a children's room, a barber's shop, and a shop selling travel souvenirs and necessaries. Third class staterooms will be fitted for two, four or six persons, and in many cases will have hot and cold running water.

Structurally the new liner will be one of the finest afloat, exceeding in material and workmanship the requirements of Lloyd's 100 A-1 rating.

The new steamer will have seven cargo holds, with large accommodation for freight, and an exceptionally large amount of refrigerated space, for the carriage of dairy produce and other cargo which requires cold storage, equipped with machinery capable of maintaining a temperature of 10 degrees. Other space, for such kinds of cargo as require it, will be fitted with fans for the circulation of cool air. Arrangements will also be made for the transport of uncrated automobiles checked as baggage.

(*Continued on Page* 37)

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Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review
By Harry Bowne Skillman
Attorney at Law

THE duty of the ship ends when it furnishes to the stevedores a safe place to work and a safe passage thereto. Defective construction, however, invokes a different rule. The ship is charged with responsibility for furnishing covers for the manholes suitable for the purposes for which they are to be used, and is not absolved from the duty of reasonable care for the safety of a stevedore invited upon the ship. A stevedore, employed by a stevedore company with whom the ship has a contract to load cargo on the ship is there by invitation, and the ship must be reasonably sure not to invite such employee into danger."—WEST ISON, 298 *Federal Reporter* 939.

* * *

A LIBELANT, sueing for loss of goods shipped under a bill of lading requiring demand for damages within 10 days after delivery, and providing that all claims for damages shall be made in the presence of the agent of the company having them in custody before removed from station or wharf, cannot recover without showing compliance with such provisions. The question of whether compliance with conditions precedent to right of recovery stated in a bill of lading has been waived is one of intention.—GENERAL G. W. GOETHALS, 289 *Federal Reporter* 933.

* * *

THE owner of a cargo, in the absence of an agreement to the contrary, is bound to exercise reasonable diligence in furnishing a place for unloading, and in causing such cargo to be unloaded promptly after notice of its arrival, subject to the usage of the port relative thereto, and the owner is not chargeable with demurrage during delay caused by the unloading of another steamer, which had reached a grain elevator before the ship containing the owner's cargo, or by repairs in the elevator during such unloading.—JAMES H. HOYT, 299 *Federal Reporter* 666.

* * *

IT IS but reasonable to say that a ship is not properly equipped for a voyage where the mate is a man known to be of a most brutal and inhuman nature, one known to give vent to a wicked disposition by violent, cruel and uncalled for assults upon sailors. Such a man may be ever so skilled and competent in navigation and seamanship, nevertheless, he is wholly incompetent, to fill a place of authority which calls for the exercise of a sense of natural fairness to men under him. It is said that the owner does not select the mate and therefore the ship cannot be held. But it is established that while the master of the ship selects the mate, in so doing he is the representative of the owner in respect to the obligation to equip the ship with a competent officer, to make her seaworthy, and the duty of the owner in such respect is one not to be delegated, or avoided by the plea that the master did not know the ship was unseaworthy when the voyage was commenced. It would follow, therefore, that if the master fails, and by reason of failure the ship is unseaworthy, and injuries are done by willful assaults upon a seaman, the owner may be held liable."—ROLPH, 299 *Federal Reporter*. 52.

* * *

FAILURE of the engineer to repack the winch, a gangwayman's giving orders by motions of his hands instead of by words of month when escaping steam prevented the winchman from seeing the signal, and the failure of the gangwayman to give warning that goods were coming down, constituted negligence of fellow servants for which the ship was not liable to longshoremen injured thereby.—CEDRIC, 299 *Federal Reporter* 815.

* * *

A LIEN under an ordinary mortgage or a vendor's lien for unpiad purchase money has no priority over liens for repairs or necessary supplies to a ship.—CULGOA, 299 *Federal Reporter* 935.

* * *

THE termination of employment of a seaman, when a boat was taken into custody by a United States marshal on a monition and subsequently sold by him. was a "discharge" within section 4527 of the revised statutes of the United States, entitling seaman, discharged before commencement of the voyage, or before one month's wages are earned, without fault on his part, to a month's wages, and section 4529, allowing discharged seaman two days' pay for every day during which payment is delayed.—GREAT CANTON, 299 *Federal Reporter* 953.

* * *

A SHIP, which had completed business of unloading and remained at the dock for purpose of fumigation, was not merely a licensee to which the owner of the pier owed no duty, except to refrain from injuring ship willfully or wantonly, though the pier owner did not charge wharfage during the time of fumigation, since an agreement by the owner of the vessel to pay reasonable compensation in consideration for use of the wharf will be implied. Knowledge by a ship owner that a pier owner had permitted inflammable refuse to remain on the track over which a switch engine was running would not preclude recovery for injuries to the ship from fire, in absence of evidence that the ship owner knew that the pier owner had not taken precautions by providing watchman and fire apparatus to guard against danger.—SANTA BARBARA, 299 *Federal Reporter* 147.

* * *

REFUSAL of seamen to assist with the cargo on Sunday when the vessel was not in a safe harbor and the work was necessary, but where the peril was not great nor danger imminent, did not warrant their discharge, in the absence of a showing of incompetency or continued willful disobedience or neglect of duty.—DONNA LANE, 299 *Federal Reporter* 977.

* * *

A CONTRACT of a steamship company to transport goods to a foreign port, and there land them at a suitable wharf, according to the law of the country of destination and the custom and usage of the port, imparts no obligation on the part of the owner of the goods to aid in the landing, and according to the decision in the case of Baltimore Steamship Co., Inc., v. Koppel Industrial Car and Equipment Co., 299 *Federal Reporter* 158, the steamship company assumes all risks of loss to itself from detention for lack of room or facilities for discharging. It was further held that where the steamship company contracted to land the cargo in the foreign port before the consignee was required to accept it, and it could have been discharged on the customhouse wharf or a bonded wharf without payment of duty, the consignee could not be required to pay the duty in advance of discharge to enable the ship to discharge at an unbonded wharf, and is not liable for delay before discharge could be made at a bonded wharf.

* * *

IT IS the duty of a tug with a tandem tow to keep it straight behind her under normal conditions, and a meeting vessel is not in fault for acting on the assumption that she is able to and will do so, it was decided in the case of R. L. MORAN, 299 *Federal Reporter* 500, in which it was also held that the starboard hand rule does not apply where one of two vessels with her tow, after rounding an island, straightened on her course, and both understood that they were to pass on meeting on meeting courses.

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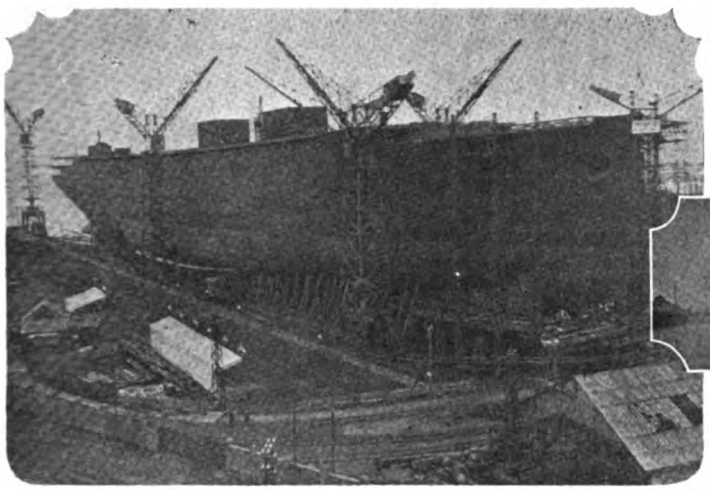
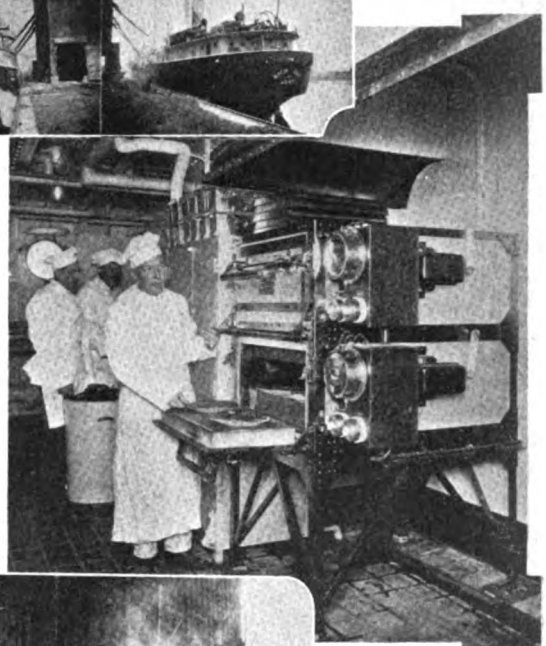
Latest Marine News in Pictures

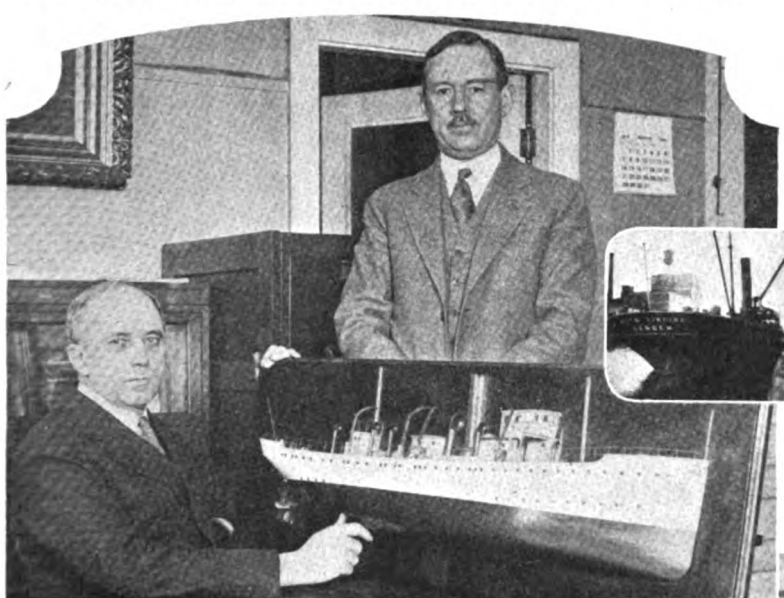


Ile de France latest addition to the French line and largest ship ever built in France, on the ways just before launching March 14, 1926. This vessel is intended for the New York-LeHavre service and is under construction at the Chantier et Ateliers de Saint—Nazaire, Penhoet

In Chicago, S. S. Back Bay loading corn for Montreal



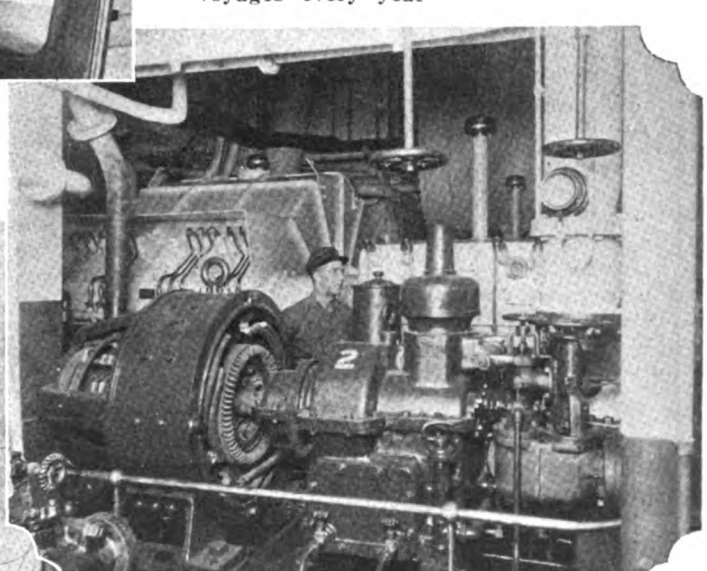
Model of new coast guard cutter Bear building at Newport News S. B. & D. D. Co. Commander J. F. Hottel, named to supervise her building. Standing, F. A. Hunnewell, designer of the new cutter



Steamer Otto Sinding of Bergen, Norway, loading barley at South Chicago for export. More direct voyages every year

Electric bake oven on the New Porto Rico liner Coamo, furnished by the Westinghouse Electric and Mfg. Co.

The first German ship dry docked by the Morse Dry Dock and Repair Co. since before the war. The stern construction of this ship is of most unusual design intended to cheapen the cost



One of the three Westinghouse 75-kilowatt turbo generators on the S S. Coamo. Special care has been taken to mount these generators securely on heavy bed plates to assure perfect alignment under all conditions of weather

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From the Old Log Book

Stray Items About the Great Lakes, Atlantic, Pacific and Gulf Coasts and Inland Rivers from MARINE REVIEW Files of 10, 20, 30 and 42 Years Ago

MAY, 1884

Much has been said recently about over production and that the problem today is one of distribution rather than production. The fear of over production is not modern.

* * *

The Marine Record (then the name of MARINE REVIEW *and a weekly) for May* 1, 1884 *carried a significant item to the effect that the proprietors of the leading steel works in Prussia, including Krupp, had informed their workmen that over production compelled them to reduce the number of working hours and some even threatened to stop their work altogether for a time.*

* * *

An effective and interesting method of appraising a vessel was adopted 42 years ago in the case of the sinking of the steamer Job M. Leonard in the Atlantic ocean off Long Island on April 18, 1877. In the first place the value of the steamer at the time of the loss had been reported to be $20,-551. On the part of the repellent, three witnesses testified that her value at the time of the loss was at least $26,000, while others estimated her value at from $25,180 to $33,000. Witnesses for the respondents placed her value at the time of the loss at from $15,750 to $18,000. To reconcile these wide discrepancies the commissioner's method of ascertaining her value was to take her cost of building, $24,000 in 1874, and to deduct from this six per cent per annum for deterioration up to the time she was sunk in 1877 to which he added the cost of a new set of sails and then from this he deducted five per cent to allow for the difference in the cost of building and consequent marine value between the year of 1874 and the year of 1877.

MAY, 1896

Thirty years ago we find in MARINE REVIEW an account of the trial of nickel steel as material for screw propellers. These experiments were made on behalf of the German naval authorities. It seems that two similar boats, one fitted with a propeller of ordinary steel while the alloy steel was used in the other, were employed in similar service. The account goes on to say that at the end of three months the ordinary steel propeller was found to be badly corroded, while the nickel steel propeller was still in good condition. However, less satisfactory results were obtained on another trial.

* * *

We learn from MARINE REVIEW *of* 30 *years ago that the Port Orchard dry dock of Puget Sound had recently been tested by the docking of the coast defense vessel* MONTEREY. *This dry dock is* 650 *feet* 5 *inches long, and as the account said* 5 *feet longer than the next largest dry dock in the United States at that time. The dry dock at Port Royal has a depth of* 39 *feet and a width at top* 130 *feet and at the base* 67 *feet, with a mean draft at high water over the sills of* 30 *feet.*

* * *

When the Fugi, a Japanese war ship was launched in England over 30 years ago, we are told by the Marine Review of that date that the wife of the Japanese minister was chosen to perform the christening ceremony. A silver knife was put into her hand and with it she cut a cord of twisted red and white silk made fast to the vessel. At that moment a cage which hung over the boat opened and let forth a number of pigeons and with them a cloud of paper squares showing the national colors.

MAY, 1906

An account is given in MARINE REVIEW May, 1906 of the twin-screw steamship NEW AMSTERDAM a splendid new addition to the passenger fleet of the Holland-America line. This vessel was built at Harland & Wolff, Belfast, was launched Sept. 28, 1905, and sailed on her maiden voyage from Rotterdam on April 7, 1906.

* * *

An inboard profile view, two cross-sectional views, and several other views are shown of a boat for the city of St. Louis under construction at that time by the Springfield Boiler & Mfg. Co., Springfield, Ill.

An interesting comparison can be made between this craft and the river boats illustrated and described in the April, 1926 *issue of* MARINE REVIEW.

* * *

Under the heading "Forced Draft," MARINE REVIEW of 20 years ago quotes Admiral Melville as saying that forced draft dates back to Stevens' ROCKET, and that its first use for marine purpose was by Robert L. Stevens on the Hudson river steamships in our own country prior to the Civil war.

MAY, 1916

The history of the Dunholme is quite interesting. In 1912 at Bayonne, N. J., while being loaded with cases of oil, an explosion occurred. Fire started and she sunk at her berth. She was then owned by the Pyman Steamship Co., a British company who abandoned her to the underwriters, Lloyds who sold her to the Merritt & Chapman Derrick & Wrecking Co., at auction for $30,000. The wrecking company raised her and took her to its pier at Staten Island where the vessel was kept until the fall of 1915 when she was sold to the Clinchfield Navigation Co. It was understood that the wrecking company netted a profit of $100,000. The Clinchfield company entered into a contract to have the Dunholme repaired at the yards of Tietjen & Lang, Hoboken. The men who went over her were surprised to find how good her condition was. However, the Clinchfield company stated at the time that they made a $300,000 contract to put this vessel back into seaworthy condition.

The work was completed and in April, 1916 the Dunholme having been sold to the Standard Oil Co., for about $850,000, started on her voyage to the East loaded with case oil. At the offices of Moore & McCormack, agents for the Clinchfield enterprises it was stated at the time that this figure was about right and that it could be said that the price was more than $800,000 anyway. In any case, it is certain that the price obtained for the Dunholme under the existing conditions was not unduly high, but it shows what life there was to marine property ten years ago as compared with today.

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Dock Management Progress Section

How Successful Dock Operators Have Met Problems of Giving Best Service to Ships

Pier 86, North River New York—Leased from the city by the United Terminals Inc.—Vessels of the United American Lines, the Hamburg American Line and the S. S. LEVIATHAN of the United States Lines dock here—Visitors leaving pier after a popular sailing

Why Balanced Pier Maintenance Pays

BY H. W. ORDEMAN
Chief Engineer, United Terminals Inc.

A JUNKMAN refused to feed his horse on Sunday because the animal performed no work on that day. The horse was worked hard during the week and as time went on the junkman discovered it was taking him longer to make his rounds so he was forced to drop some of his customers. Earnings decreased and he decided to trade the horse for another but the trade value of his animal was junk. The earning power and trade value of the horse would have averaged higher had he been properly maintained but would the cost of maintenance when compared with increased profits and salvage value have been justified?

Maintenance is defined by the lexicographers as "the art of holding or keeping in any particular state." It means feeding the animal every day, not a big banquet once a year or an orgy of spending in order to fulfill a leasehold obligation. The homely old adage, "a stitch in time saves nine" was surely prompted by the embarassment of deferred maintenance. Eliminating such items as pride, moral obligations and public trust, the vague abstractions that are too often called upon to justify maintenance expenditures, and adhering to the bread and butter proposition of black figures on the balance sheet, concrete examples will do more to convince the pier owner or lessee of the importance of economic maintenance.

Good Operation Depends on Rigid Maintenance

All piers have been built for the special purpose of reducing the time and the cost, and minimizing the inconvenience, of debarking and embarking passengers and the discharging and loading of cargo. The latest modern piers, such as the one illustrated, in design and construction, embody the best scientific knowledge and the accumulated practical experience of many years. In operating a pier, any laxity in maintaining it at its original condition, is bound to lessen its efficiency as a tool for the purposes intended and will thus increase the cost of operations. It pays to use the best suited and most efficient accessories of every kind, from fighting fire to non-slip treads on the gangways, and to insist upon painting, cleanliness and good order because all these things will help to improve the dispatch of handling passengers and freight thus materially reducing the cost.

When a structure is taken over under lease an occupation survey should be made by lessor and lessee or their representatives and all defects should be noted and agreed upon. This proceedure will eliminate any questions that may arise when the property is vacated and ofttimes ensures that the structure is placed in good condition by the lessor thus reducing maintenance. A vacation survey on expiration of lease completes the evidence of proper maintenance and physical condition.

From the occupation survey prepare a maintenance schedule covering at least a period of two years and better yet for the term of the lease. On the basis of such a survey estimate the total cost. Damage and operation are not to be included in this schedule as damage is generally recovered in the form of insurance and operation is based on

(*Continued on Page* 54)

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Westinghouse Promotes G. H. Froebel

The many people connected with the marine industry who have come into contact with G. H. Froebel, manager of marine sales for the Westinghouse Electric & Mfg. Co. since 1923, while congratulating him on his well deserved promotion to manager of central station sales for the same company, will at the same time miss his honest straight-forward genial personality. Mr. Froebel as manager of marine sales greatly increased the business of the Westinghouse company along this line and his promotion to a larger area of activity is due to the success he made in what is indeed a difficult field. He is only 37 years of age. Born at Boerne, Texas, on Oct. 1, 1889, he was raised in San Antonio. The story of his early life indicates the usual struggles for those who go ahead. He was graduated from the San Antonio high school in 1907 and for two years thereafter attended the University of

G. H. FROEBEL
Formerly head of marine sales of Westinghouse appointed central station sales manager

Texas. He then entered the employ of the San Antonio Gas & Electric Co. and the San Antonio Traction Co. remaining with these companies until 1912. Beginning then as an apprentice he has been with Westinghouse ever since except for War service.

Appointed Manager Marine Sales Vacuum Oil Co.

An announcement was recently made by the Vacuum Oil Co. that E. J. Into had been appointed domestic sales manager of its marine department.

Mr. Into was formerly connected with the automotive department of the same company. Before coming

E. J. INTO
Domestic Sales Manager, Marine Department Vacuum Oil Co.

to the Vacuum Oil Co. he was in the United States navy holding the rank of lieutenant senior grade and had served as chief engineer, electrical officer and tactical officer of one of the latest type submarines. He has also had extensive experience in naval aviation, and is a graduate of the University of Maryland.

His intimate and practical knowledge of marine machinery should be of especial interest to those with whom he comes in contact.

The company also announced the addition of A. J. Armson of Port Huron, Mich., to its marine sales department, on the Great Lakes, with headquarters at Chicago. Mr. Armson is probably one of the best known engineers on the Great Lakes, having formerly been connected with the Pittsburgh Steamship Co. of Cleveland for many years.

Another addition to the sales force of the Vacuum Oil Co. is that of James H. McGinty, who is acting as sales representative at Philadelphia. Mr. McGinty replaces Henry H. Lawton who has been retired after 25 years of service with the company. Mr. McGinty was formerly marine superintendent at Philadelphia for the Munson Steamship Lines. He has been for some time a member of the maritime exchange and is well known among the trade at that port.

Due to a late spring, navigation is not expected to open on the Great Lakes this season before early in May.

Marine Department Sales Under M. B. Lambert

The marine department of the Westinghouse Electric & Mfg. Co. has been merged with that of the railway department in one major department of transportation. On April 1, 1926 when Mr. Froebel was promoted to the central station field, Myles B. Lambert, manager of the railway sales department was made manager of the transportation sales department, including marine.

Mr. Lambert was born in 1873 at Roslyn, Long Island. He worked on a farm in the summer and at the age of 14 he went to work in Brooklyn as a driver on a milk wagon. He next accepted a position with the Long Island railroad as brakeman, and then later as telegraph operator and then assistant in a switchtower where he completed his course in telegraphy. After this he returned to the work of brakeman in the passenger service of the Long Island railroad. His next step was as ticket

M. B. LAMBERT
Becomes head of transportation sales of Westinghouse, which includes marine and railways

agent and telegraph operator for the Kings County Elevated railroad. From this position he was advanced rapidly through various grades and within five years became division superintendent. He then joined Westinghouse.

In 1909 he entered the railway sales department as head of the railway equipment division, since this time he has been steadily advanced and he is now manager of the entire transportation sales department including marine as well as rail.

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Lake Carriers Elect Officers

Hold Annual Meeting in Cleveland—Fight Chicago's Diversion of Water—Support River Straightening—Means To Raise Lake Levels

UNDER the leadership of J. S. Ashley, president, and Newton D. Baker, general counsel, the Lake Carriers' association at its annual meeting in Cleveland April 17, presented a solid front in the fight of all the Great Lakes states against the sanitary district of Chicago, in its diversion of waters from Lake Michigan for flushing its sewage.

The meeting convened at the Hotel Hollenden. An important unanimous agreement, after some opposition was reached on the adoption of north-about and south-about routes on Lake Michigan. This means that in the future all vessels, members of the Lake Carriers' association, must follow on Lake Michigan the courses defined by the Captains' committee, similar to those at present in operation on Lakes Huron and Superior. Upbound boats will go west of Beaver Island and downbound boats to the east. This measure was adopted solely to increase the safety of navigation. An attempt will be made by President Ashley to have the passenger lines, although not members of the association, adopt similar regulations.

It was brought out at the meeting that the initial recommended load draft for the opening of navigation is 17 feet 9 inches, which is 9 inches less than last year.

Loading Draft Reduced

The question then arose what could be done about the vessels now at the head of the lakes which had loaded last year to a draft of 18 feet 6 inches. Colonel Dent was of the opinion that perhaps vessels loaded to 18 feet could get through, but that it was probably not advisable for those loaded 18 feet 6 inches to try it. The situation will be closely watched, and the vessel owners will be advised by the army engineers.

At the recommendation of A. E. R. Schneider, manager of the Cleveland Cliffs fleet, a committee was appointed by President Ashley to draw up a recommendation to present to congress proposing the study and building of compensatory and regulatory works in order to raise lake levels. A. E. R. Schneider was made chairman and L. C. Sabin, A. F. Harvey and R. W. England, members of this committee.

The routine matter of the election of officers was attended to with expedition. Over 90 per cent of the tonnage membership of the association was represented. The newly elected officers and directors are listed in the accompanying inset.

Straighten Cuyahoga River

A most important action was taken by the Lake Carriers in wholeheartedly and unanimously supporting the comprehensive Cuyahoga river straightening scheme presented before them by City Manager W. R. Hopkins. In effect, Hopkins said: "Gentlemen, here is a practical proposition for straightening the Cuyahoga river, which, when accomplished, will reduce the running time to the furnaces by approximately one hour.

"In order to carry through this definite and practical project, it is necessary to allow the railroad bridges, necessitated by the new terminal, to be so built that the clearance will be from 75 to 80 feet. This is lower than is permissible for navigable waters and it is therefore necessary to obtain the approval of the federal government, and the support of the Lake Carriers would be the determining factor. With your approval definite steps can and will shortly be taken in straightening this river."

At two o'clock in the afternoon, a meeting of the Great Lakes Protective association was held at the Hotel Hollenden. The only business transacted was the election of the advisory committee and a brief statement by the president, J. S. Ashley, which emphasized the comparatively light losses for the year 1925 and the fact that the association, in so far as the records were in, would show an estimated excess contribution of approximately 31 per cent. Total contributions amounted to $453,744.22 while expenses and losses paid less recoveries was $311,649.98 indicating a favorable balance of $142,094.24.

The newly elected members of the advisory committee for the year are: J. S. Ashley, H. Coulby, C. L. Hutchinson, C. D. Dyer, H K. Oakes, A. E. Cornelius, F. I. Kennedy, A. E. R. Schneider, J. T. Kelly, R. W. England, A. F. Harvey and A. T. Kinney. This committee met on April 22 and elected J. S. Ashley, chairman; Geo. A. Marr, secretary; A. E. R. Schneider, treasurer; J. A. Armstrong, assistant treasurer and Harvey D. Goulder, counsel.

Legal Status of Diversion

The day's activities terminated by a banquet at the Hotel Hollenden. A number of prominent guests attended, among which were the Hon. T. V. O'Connor, chairman of the United States shipping board; A. A. Wright, honorary president, Dominion Marine association of Canada; Dickerson N. Hoover, supervising inspector general, United States steamboat inspection service; Colonels Cosby, Pillsbury and Dent of the United States engineers; City Manager William R. Hopkins and others.

The outstanding feature of the dinner was the speech by Newton D. Baker, in which he clearly defined the legal status of the diversion of water by the sanitary district of Chicago.

(*Continued on Page* 62)

Officers

Lake Carriers' Association

President
J. S. Ashley

Vice President
L. C. Sabin

General Counsel
Newton D. Baker

Secretary and Treasurer
George A. Marr

Executive Committee

J. S. Ashley, chairman, H. S. Wilkinson, C. L. Hutchinson, H. Coulby, C. D. Dyer, J. J. Boland, G. A. Tomlinson, J. C. Evans, A. E. R. Schneider, A. F. Harvey, H. K. Oakes.

Alternates

J. T. Kelly, A. C. Sullivan, A. W. Thomson, W. P. Schaufele, W. H. McGean, J. B. Ayers, James McAlpine, A. H. Ferbert, W. G. Stewart.

Directors

Cleveland

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How Lake Levels Can Be Raised

Levels Now 30 Inches Below Normal—Stopping Chicago Drainage Only Partial Remedy—Build Dams and Controlling Works at Port Huron and Buffalo

BY J. R. SENSIBAR

THE argument over the withdrawal of water from Lake Michigan by the sanitary district of Chicago has resolved itself into a mud slinging contest. There are altogether too many lawyers in the argument and too few good engineers, and as might be expected, common sense is conspicuous by its absence.

All of the water withdrawn by the sanitary district canal at Chicago in one year is the equivalent of only a little over 1 inch in the lake level of Michigan, and a fraction of an inch per year if Lakes Huron and Erie and connecting waterways are taken into consideration. In other words, if the sanitary district canal were blocked completely and no water withdrawn through that channel it would take over 30 years to bring back the level of the lakes to where it was a few years ago, all other things being equal. The lake level now is approximately 30 inches below what it was about three or four years ago. All told, all of the water withdrawn by the sanitary district canal since it has been built is accountable for approximately 6 inches in the level of the lakes. It is therefore obvious that regulating the flow in the district canal will affect the lake level only in a minor degree.

Reasons for Low Water

There are four principal reasons for the dropping of the level of the lakes. In the order of their importance they are as follows:

1. The varying of the level of the lakes, as well as that of the ocean over a cycle of years.
2. The ever increasing withdrawal of water by the power companies above Niagara Falls.
3. The withdrawal of water by the sanitary district canal at Chicago.
4. The deforestation of the areas tributary to the Great Lakes.

The water level of the Great Lakes as well as on the Atlantic ocean, varies as a whole from year to year, and over a period of years fluctuates as much as several feet from the minimum low to the maximum high. We are now in the low period of such a cycle. The water is low on the Atlantic coast as well as on the lakes. Reports from the Atlantic coast from Florida to Maine complain of the low water at the docks and channels very much the same as on the lakes. During one year in the eighties the water was lower in the lakes than it had been during any year previous or since until the present low water period. It was this low water level that was used as a standard by which the datums in the various cities along the lakes were established. At that time there was no sanitary canal, there were no power companies at Niagara Falls, there was no deforestation, and still the water fluctuated.

Loss of Water at Niagara

In former years approximately 16 feet of water ran over the brink of the falls at Niagara. In other words, the sheet of water falling over the precipice at Niagara Falls was 16 feet thick. The power companies have tapped above the falls and diverted a great part of the water through canals leading to their water turbines. This, in a large measure, has reduced the amount of water going over the falls so that now there is only a sheet of water going over the American falls varying in depth from a few inches to 2 or 3 feet. The level of the top of the water at the brink of the falls has been lowered by at least approximately 10 feet, which in turn has lessened the resistance to the water above the falls.

It is a well-known fact that forests draw rainfall; since the forests have been pretty well cut out along the Great Lakes, it is obvious that this has affected the rainfall considerably. In other words, deforestation has tended to reduce the amount of water drained into the Great Lakes from the tributary water sheds.

I have talked this matter over with a number of vessel men and engineers who have given the subject a great deal of thought and study. Those to whom I have talked agree with me, that in the absence of an additional supply of water into the lakes, there is but one sensible solution to the problem. The solution is controlling works at Port Huron or some other location in the Saint Claire river, and another one at Buffalo or some other point in the Niagara river.

Control Works Practical Solution

From an engineering standpoint this is a comparatively simple problem. A dam with locks and a spillway should be constructed at each of these places. The control works in the Saint Claire river would regulate the level of the water in Lakes Huron and Michigan. The one at Buffalo would control the level of Lake Erie, the Detroit river, Lake Saint Claire and the Saint Claire river. The lift at the Port Huron locks would be approximately six feet, and that at the Buffalo lock, not much over that. This is a very small lift for vessels, as locks go.

No one would be hurt by this construction. The power companies at Niagara would have just as much water available after the construction of these dams as they had before. There would be just as much water going over the Niagara falls as there is now without the dams. It is obvious that only the water flowing into the lakes can flow out of the lakes. The increase in the depth would be accomplished during temporary periods of high water and would not be noticed by the power companies. To illustrate the point on a much smaller scale, only the water poured into a cup will flow over the rim regardless of the depth of the cup. If the depth of the cup were increased from two to ten inches, once the cup is full the same amount of water would run over the rim as put in.

I believe it would be a great service to the large communities around the Great Lakes if a bill was passed in congress requiring the corps of engineers to make a survey of this situation and the feasibility and cost of constructing these dams and locks at the two places above outlined. I know it will meet the approval of all level headed men who have made a study of the problem.

The author, J. R. Sensibar, is president of the Construction Materials Co., Chicago. Since this article was written a bill calling for a survey as proposed has been introduced in congress by the Hon. Adolph Sabath, representative from Illinois.

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Profits Go Down, With Water

Great Lakes Vessel Interests Estimate Loss on Transportation of Iron Ore in 1926 in Millions of Dollars—Rate to Shippers Unchanged but Rate to Them Is Cut—Carriers Protest

ALL Great Lakes shipping is represented in the protest sent by the Lake Carriers' association to congress recently, against diversion of lake water through the Chicago drainage canal. The Great Lakes vessel interests now are fighting a "joker" in the rivers and harbors bill to permit Chicago to extract water for a "navigation" project. By this means, it is believed, the issue as to Chicago's right to divert the water for drainage purposes is confused, and votes have been won by attaching a rider to the legitimate rivers and harbors bill. The Illinois representatives are reported to be trading support with those from other sections of the country.

Telegrams warning Ohio congressmen against this were sent by Pickands, Mather & Co. and one of its directors, Harry Coulby, president of the Interlake Steamship Co.; the M. A. Hanna Co., and its vice president, Richard F. Grant; and the Bethlehem Steel Co., and Herbert K. Oakes, vice president of the Bethlehem Transportation Co.

Some of the Great Lakes vessel companies are estimating their prospective losses for 1926 due to the lowering of the water level. The recommended draft for the opening trip this season is 17 feet 9 inches, compared with an average draft of 18 feet 8½ inches last year. Various estimates, taking into consideration the progressive reduction in the water level over a period of years, indicate the carriers will lose $1,000,000 to $3,000,000 this year on the transportation of iron ore.

A reduction in water level has the same effect for the carriers as a cut in freight rates. As an illustration of this, one company points out that if its fleet carried 100,000 tons of a commodity on each trip in 1925 at $1 a ton, but this year by reason of reduced draft it can carry only 90,000 tons a trip, at the same tonnage rate, its trip revenue this year is 90 per cent of what it was last year, and therefore the result is the same as if the rate had been cut to 90 cents. The trip capacity is lowered; more trips are necessary, and though the shipper pays the same rate as in the preceding year, the loss falls on the carrier.

The season's contract rate on iron ore from the head of the lakes to lower lake ports was 70 cents a ton in 1922, 1924 and 1925.

The average draft on which vessels operated in 1922 was 19 feet 8¾ inches. This represents the draft at which the ore was moved. The ore season is considered as May 1 to Nov. 1. The draft of course determines the weight of the vessel's cargo.

In 1924 the average draft had dropped to 19 feet; and in 1925 it was reduced to 18 feet 8½ inches.

How Tonnage Is Reduced

A typical fleet of eight vessels, loaded to the limit of the draft, averaged 71,462 tons of iron ore to a trip in 1922. In 1924 the same fleet, loaded to the draft limit, averaged only 67,985 tons a trip. Although the rate was unchanged, the revenue on each trip for the owner of the fleet was only 66.6 cents a ton as compared with 1922.

The same fleet was able to average only 66,207 tons on the reduced draft in 1925. The rate remained 70 cents, but the reduction in revenue per trip compared with 1924 was the same as though the rate had been reduced to 68.2 cents. The reduction compared with 1922 was equivalent to a rate of 64.9 cents

Estimates of the loss in revenue in 1926 are based on anticipated reduction in the draft. The recommended draft for the opening is 17 feet 9 inches. If the lowest estimated draft is effective the reduced income from each trip for the fleet referred to, as compared with 1925, would be equivalent to a reduction in the freight rate to 65 cents, a loss of 5 cents from the actual rate of 70 cents, and on a movement of 60,000,000 tons of iron ore, approximately $3,000,000. The reduced income per trip in 1926 on such a draft, compared with 1922 is the same as a reduction in the freight rate of 10 cents a ton.

Other estimates allowing for variations in the draft for the season of 1926 have been made up, one based on an average draft of 18 feet, and another on 18 feet 6 inches. The actual average draft is expected to be somewhere between the estimate of 18 feet 6 inches, and 17 feet, 9 inches. The accompanying table shows the corresponding rates to the vessels operating at these drafts. Some vessel interests believe the actual loss to them will be 2 to 3 cents per ton on iron ore for the season.

The rate to shippers has not been determined, but in view of the fact that the 1925 iron ore prices were continued this year, it is believed the vessel rate will be repeated at 70 cents.

(*Continued from Page* 29)

All the latest appliances for the swift and efficient handling of the cargo will be installed.

The LAURENTIC'S machinery will consist of two sets of four-cylinder expansion balanced reciprocating engines operating wing propellers and a low pressure turbine operating a center propeller.

The installation is of the same type as the OLYMPIC'S, and is designed to give a sea speed of 16½ knots. Coal will be used as fuel in four double ended and four single ended boilers, arranged for natural draft.

How Water Diversion Affects Rates

1922 Avge. Draft 19′ 8¾″	1924 Avge. Draft 19′ 0″	1925 Avge. Draft 18′ 8½″	1926 Est. Draft 18′ 6″	1926 Est. Draft 18′ 0″	1926 Est. Draft 17′ 9″
10,323	9,856	9,576	9,500	9,100	8,900
10,104	9,647	9,400	9,400	9,000	8,800
9,850	9,165	9,063	9,000	8,600	8,400
9,272	8,765	8,469	8,400	8,100	7,950
9,144	8,663	8,400	8,300	8,000	7,850
8,458	8,162	7,939	7,600	7,300	7,150
7,165	6,951	6,743	6,600	6,350	6,250
7,146	6,776	6,647	6,500	6,250	6,150
71,462	67,985	66,207	65,300	62,700	61,450
Based on 70c in 1922 .... $0.666		.....	.....	.....	.....
Based on 70c in 1924		$0.682	.....	.....	.....
Based on 70c in 1922		0.649	.....	.....	.....
Based on 70c in 1925		.....	$0.690	$0.663	$0.650
Based on 70c in 1924		.....	0.672	0.646	0.633
Based on 70c in 1922		.....	0.640	0.614	0.602

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What the British Are Doing

Short Surveys of Important Activities in Maritime Centers of Island Empire

THE Anglo-Saxon Petroleum Co. Ltd. of London have placed with Harland & Wolff, Ltd. orders for four motor propelled vessels designed for the carriage of oil in bulk. They will be built in the Govan yard fitted with Harland & Wolff-Burmeister & Wain engines from the same firm's diesel engine works, Glasgow. One will be of 1050 tons, one of 3600 tons and two of 2300 tons each. Including orders placed with Swan Hunter & Wigham Richardson and two placed with foreign firms the Petroleum company have ordered recently nine motor tankers from six different firms.

* * *

BRITISH TANKERS LTD. have ordered a motor oil tanker from Sir James Laing & Sons Ltd., Sunderland and one from William Gray and Co., Ltd., West Hartlepool.

* * *

THE Fairfield Shipbuilding & Engineering Co., Govan, have launched the light cruiser BERWICK, the second war vessel to be put into the water on the Clyde of the admiralty's postwar program of naval construction, and the first light cruiser. Details are not obtainable of the BERWICK. the county class of cruisers to which it belongs being more or less mystery ships. They are, however, of 10,000 tons displacement, and they are up to the limits in size, speed and gun power defined by the Washington conference for their type, the calibre of the main armanent being restricted to 8-inch guns. They will be propelled by quadruple screws driven by geared turbines obtaining steam from oil fired Yarrow boilers. Four others are being built at Devonport, Portsmouth, Dalmuir and Newcastle-on-Tyne. The program provides for a total of 14 during the next few years. She was the 145th contract carried out by the company for the British admiralty.

* * *

PALMER & CO. of Jarrow have launched the PECTEN of 10,000 tons, the first of the several oil tankers oredered by the Anglo-Saxon Petroleum Co. Diesel engines are of the advanced type, Werkspook designed, constructed by the North Eastern Marine Engineering Co. of Wallsend and are the largest single screw diesel engines yet fitted into a vessel.

* * *

FAIRFIELD SHIPBUILDING & ENGINEERING CO., LTD., Glasgow. have received an order for a 2850 tons gross passenger motor ship from Shaw Savill Albion Co., similar to the Arangi of the New Zealand Union Co. The engines will be of the Sulzer type, with quadruple screw arrangement. There will be accommodation for 250 first and 700 third class passengers and also extensive refrigerated cargo space. The speed will be about 17 knots. A similar order has been placed on the Tyne with Swan Hunter and Wigham Richardson.

* * *

ACCORDING to a report from Berlin, representatives of Russian Trusts and the Soviet Commercial fleet are in Germany prepared to place orders with various European countries. The program provides for

(*Continued on Page* 42)

What's Doing Around The Lakes

THE ALABAMA of the Goodrich line went off the Chicago-Muskegon run, April 17, to go to Manitowoc for docking and to have her summer wheel put on. The CITY OF SAUGATUCK replaced her. Only minor repairs are needed by the ALABAMA this spring.

* * *

THE Goodrich Transit Co. has leased 1200 feet of space on the Chicago municipal pier, at the shore end of the south side, and is concentrating its freight loading there. This will leave its present dock at the south end of the Michigan avenue bridge, Chicago, practically free for passenger traffic. It is expected that incoming consignments of perishable fruits will continue to be handled at the Michigan avenue dock as a matter of time economy.

COLD weather in April retarded the normal growth in spring passenger business experienced by the Lake Michigan lines. An unusually large number of conventions booked for Chicago and Milwaukee this summer gives promise of good excursion business this season.

* * *

IF THE attendance at the Catholic eucharistic conference at Chicago early in June taxes housing accommodations, as is feared, several of the Goodrich line steamers will be put into commission earlier than planned tied up at the Chicago municipal pier and used as floating hotels.

* * *

THE GREAT LAKES DREDGE & DOCK CO. has resumed work on the harbor project at Buffington, Ind., for the Universal Portland Cement Co., a Steel corporation subsidiary. A fleet of sandsuckers is dredging an inner basin, while piles for the docks are being driven. The harbor, which will be used exclusively by the company, is expected to be completed in November but limestone may be brought in beginning in June. Coal and limestone will form the bulk of incoming cargoes and cement of outgoing.

* * *

THE UNITED STATES, of the Peninsular & Northern Navigation Co., Milwaukee, is expected back on her usual Lake Michigan summer run, across the lake from Milwaukee, the last week of June. After a winter in Florida the UNITED STATES is sailing from New York, May 4, for Milwaukee. Passengers are being carried on the return trip.

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Late Flashes On Marine Disasters

Brief Summaries of Recent Maritime Casualties— A Record of Collisions, Wrecks, Fires and Losses

Name	Date	Nature	Place	Damage Resulting
Alfred Ock Hedley	Jan. 11	Ashore	Off Frying Pan Slue	Floated
Athelstarn	Jan. 16	Fire	New Orleans	Slight
August Blume	Jan. 4	Touched bot.	Nr. Nykoping	Not stated
Alegrete	Jan. 7	Collision	New York	Not stated
Ardgarroch	Jan. 6	Aground	Havre	Not stated
Audace	Jan. 6	Collision	Dubrovnik	Sank; total loss
Aylesbury	Jan. 6	Aground	Rotterdam	Not stated
Anna B.	Jan. 7	Icebound	N. of Bremo Is.	Not stated
Alf	Jan. 8	Aground	West Scaw	Floated
Altengamme	Jan. 9	Stranded	Monnin Rocks	Leaking
Ariadne	Jan. 10	Ashore	Garton Gap	Floated
Amiral Troude	Jan. 14	Disabled	Brest	Leaking
Austvard	Feb. 3	Aground	Savannah	Not stated
Avarua	Feb. 6	Fire	Davao Gulf	Total loss
Apis	Feb. 5	Not stated	Not stated	Abandoned
Briliant	Jan. 26	Collision	Kettle Point	Bows
Barge No. 32	Jan. 28	Fire	Brooklyn	Slight
Baltimore Maru	Jan. 4	Disabled	Port Sudan	Machinery
Begona No. 2	Jan. 1	Struck wall	Tonnay Charente	Not stated
Brinkburn	Jan. 2	Stranded	Mehedya	Floated
Bernisse	Jan. 11	Ashore	Nr. Blankenese	Floated
Baltique	Jan. 9	Collision	Eastham Locks	Not stated
Brandon	Feb. 5	Aground	Miami	Floated
Carriso	Jan. 13	Collision	Columbia River	Not stated
Cornishman	Jan. 15	Ashore	River Mersey	Floated
California	Jan. 19	Collision	Off Quarantine	Damaged
Centaurus	Jan. 20	Aground	Oakland	Floated
Collamer	Jan. 26	Collision	Kettle Point	Bows
Ceuta	Jan. 27	Collision	Brooklyn	Starboard side
Cecilie	Jan. 4	Foundered	Bay of Biscay	Not stated
City of Taunton	Jan. 6	Ashore	Harts Island	Floated
City of Fort Worth	Jan. 7	Collision	Philadelphia	Slight
Commaire Ramel	Jan. 7	Fire	Marseilles	Considerable
C. F. Lilejevalch	Jan. 11	Aground	Port Talbot	Floated
Croxteth Hall	Jan. 13	Collision	River Scheldt	Bows
Cap Fedhala	Jan. 13	Collision	Casablanca	Slight
City of Agra	Feb. 4	Ashore	Cochin	Not stated
Caithness	Feb. 6	Collision	Off Liberty	Starboard and port side
Doris	Jan. 4	Fire	Cardiff	Slight
Delfia	Jan. 13	Collision	River Scheldt	Floated
Dinteldijk	Feb. 5	Struck quay wall	Panama Canal	Plates, etc.,
Delaware	Feb. 5	Aground	Miami	Floated
Dorothy M. Smart	Feb. 1	On reefs	Lunenburg	Floated
Elly	Jan. 18	Disabled	Barbados	Steering gear; engines
Elsie G. Silver	Jan. 17	Ashore	Bourne	Engine
E. Y. Townsend	Feb. 1	Aground	Buffalo	Not stated
Empress	Jan. 11	Collision	Not stated	Not stated
Edward Y. Townsend	Feb. 1	Aground	Buffalo	Floated
Excellecen	Jan. 15	Ashore	E. Lillesand	Not stated
Erholm	Feb. 9	Fire	Willemstad	Considerable
Finland	Jan. 25	Struck dock	San Francisco	Not stated
Fidelitas	Jan. 4	Leaking	Lisbon	Not stated
Fox	Jan. 7	Disabled	Yarmouth	Engine
France	Jan. 7	Collision	Lorient	Sank—floated
Favel	Jan. 8	Aground	Port Phillip	Not stated
Georgian	Jan. 13	Disabled	Off Balboa	Prop. lost
George T. Locke	Jan. 17	Aground	Miami	Not stated
Grelstone	Jan. 24	Collision	River Scheldt	Bow
Glenpark	Jan. 6	On rocks	Frances Jey	Not stated
Grantully Castle	Jan. 14	Collision	St. Clement's Reach	Starboard side
Girasol	Jan. 14	Collision	Lynn Roads	Not stated
Gunnar Heiberg	Jan. 15	Aground	No. Dragor	Floated
Harriet C. Whitehead	Jan. 17	Collision	Cape Fear River	Slight
Halfmoon	Jan. 24	Aground	Constable Hook	Floated
Hakushika Maru	Jan. 25	Collision	Willamette River	Not stated
Helgoland	Jan. 11	Touched ground	Not stated	prop. blades lost
Hartfell	Jan. 11	Struck rocky bottom	Vestmann Isles	Abandoned
I. F. Chapman	Jan. 12	Collision	Watch Hill	Considerable
Inkula	Jan. 14	Hvy. weather	Not stated	deck, tank, etc.
Jackson	Jan. 17	Aground	Miami	Not stated
Juno	Jan. 4	Not stated	Kockar	Total loss
Jura	Jan. 4	Collision	King's Dock	Not stated
Jutlandia	Jan. 3	Collision	Antwerp	Port side
J. E. O'Neil	Jan. 7	Ashore	Philadelphia	Not stated
John Gibson	Jan. 11	Collision	Not stated	Sank
Jolly Charles	Jan. 11	Collision	Lower Hope	Not stated
Kurt	Jan. 4	Touched ground	Kiel	Not stated
Kansan	Jan. 6	Fire	San Francisco	Cargo
Kilchearan	Jan. 12	Ashore	West Coast Islay	Not stated
Kong Alf	Jan. 13	Grounded	Kjoegrand	Floated
Katherina Dorothea Fritzen	Jan. 13	Aground	Nr. Hook of Holland	Floated
Kasenga	Jan. 15	Ashore	Torre Faro	Not stated
Kenwood	Feb. 4	Ashore	Cedar Point	Not stated
Karin	Feb. 8	Disabled	Philadelphia	Machinery
Linkmoor	Jan. 18	Hvy. weather	Portland	Deck, steering gear, etc.
Lake Fairport	Jan. 18	Aground	Miami	Not stated
Liberty Land	Jan. 26	Collision	Marseilles	Damaged
Lake Frances	Jan. 25	Collision	Willamette River	Considerable
Luciline	Jan. 5	Aground	New Orleans	Floated
Lotte Leonhardt	Jan. 7	Fire	Off Outer Gabbard	Not stated
Louisa	Jan. 7	Ashore	Portsmouth harbour	Floated
Lynx	Jan. 10	Collision	Antwerp Roads	Not stated
Les Jumelles	Jan. 14	Stranded	Lorient Roads	Serious
Mary J. Beale	Jan. 13	Ashore	Portsmouth Shore	Floated
Morris and Cliff	Jan. 16	Aground	So. of Swansboro	Total loss
Manchester Merchant	Jan. 19	Collision	Port Richmond	Bows
Margaret	Jan. 19	Collision	Port Richmond	Bows
Missouri	Jan. 21	Struck obs.	Lake Michigan	Wheel
Maid of England	Jan. 4	Fire	Not stated	Not stated
Manuela Pla	Jan. 7	Capsized	Mobile	Sank
Maridal	Jan. 11	Struck on	Angra Reef	Bottom
Marie	Jan. 11	Collision	Off Antrim	Stem
Manin	Jan. 14	Collision	Genoa	Not stated
Merganser	Jan. 9	Collision	Eastham Locks	Bulwarks; plate
Mercurio	Feb. 1	Sprang leak	No. Utila Island	Sank
Nancy Hanks	Jan. 14	Ashore	Miami	Floated—leaking
New Brooklyn	Jan. 30	Collision	Philadelphia	Stern; bows
Newsome	Jan. 30	Collision	Philadelphia	Stern
Newtonmoor	Jan. 7	Collision	Philadelphia	Slight
Normalisering	Jan. 6	Fire	Gydnia	Not stated
Nesta	Jan. 11	Collision	Lower Hope	Sank
Nidd	Jan. 13	Ashore	Bats	Floated
Orleans	Jan. 14	Aground	Red Hook Flats	Floated
Ophelia	Jan. 7	Stranded	Oland	Not stated
Oued Tiflet	Jan. 7	Aground	Casablanca	Floated
Ormond	Jan. 9	Sank	Sandy Hook	Not stated
Pavia	Jan. 4	Collision	King's Dock	Nr. stem
Petka	Jan. 6	Collision	Dubrovnik	Not stated
Polydorus	Jan. 2	Collision	River Mersey	Not stated
Parnahyba	Jan. 13	Collision	Santos	Not stated
Persian Prince	Jan. 13	Collision	Santos	Considerable
Pere Marquette 18	Jan. 14	Ashore	Manitowoc	Not stated
Robert E. Lee	Jan. 14	Aground	Miami	Floated
Robert B. Burnie	Jan. 13	Gale	Off Captive	Foundered
Roseway	Jan. 30	Ice	Staten Island	Prop. blades
Radnorshire	Jan. 8	Collision	Near Crosby	Bow; plates
Rita	Jan. 13	Ashore	Alderney	Bottom
Retraction	Feb. 6	Fire	Not stated	Sinking
Seneca	Jan. 12	Collision	Watch Hill	Considerable
San Zotico	Jan. 19	Collision	Off Quarantine	Leaking badly
Solvang	Jan. 25	Collision	Not stated	Not stated
Swiftlight	Jan. 22	Collided bridge	Fall River	Not stated
San Silvestre	Jan. 4	Collision	Tidal Basin	Not stated
San Zeferino	Jan. 4	Collision	Tidal Basin	Not stated
Selandia	Jan. 7	Ashore	Middelgrunden	Floated
Santa Rosalia	Jan. 9	Ashore	Not stated	Not stated
Sheldon	Jan. 11	Aground	Nr. Kvaroey	Floated
Sic Vos Non Vobis	Jan. 13	Collision	Genoa	Not stated
Sudbury	Jan. 13	Collision	Genoa	Not stated
Sapper	Jan. 14	Collision	St. Clement's Reach	Stem
Sylvia	Jan. 14	Stranded	Near Stromstad	Not stated
S. W. Sommers	Jan. 14	Ashore	Chesapeake Bay	Not stated
Seminole	Jan. 15	Aground	Askew Spit	Floated
Selwyn Eddy	Feb. 4	Disabled	So. Fenwick Is.	Not stated
Taibu Maru	Jan. 14	Ashore	Serrana Reef	Floated
Trumf	Jan. 6	Dam. by ice	Not stated	Leaking
T. J. Hooper	Jan. 9	Sank	Sandy Hook	Not stated
Ulrikka II	Jan. 2	Collision	River Mersey	Stem; bow
Valdura	Jan. 12	Ashore	W. of Tuskar Rock	Bottom
Vacuum	Jan. 25	Collision	Not stated	Bows
Victoria Koepke	Jan 1	Aground	Nr. Stubbekobing	Not stated
Valkyrie	Jan. 9	Hurricanes	Not stated	Leaking
Welsh City	Jan. 13	Collision	Columbia River	Not stated
West Harshaw	Jan. 14	Collision	Genoa	Not stated
Willsolo	Jan. 24	Aground	Ambrose Channel	Floated
Wolotia	Jan. 5	Ashore	Odense	Floated
W. E. Ogilvie	Jan. 12	Aground	Nuevitas	Not stated
Wordsworth	Jan. 13	Aground	Esbjerg	Not stated
West Harshaw	Jan. 14	Collision	Genoa	Not stated
West Cawthon	Feb. 4	Fire	New York	Considerable
York	Jan. 4	Ashore	Shinnecock Point	Floated
Yosemite	Feb. 7	Struck beach	Point Reyes	Sank
Zebedee E. Cliff	Jan. 20	Collision	Boston	Port side—filled
Zelia	Jan. 13	Ashore	Barcares Beach	Not stated

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Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1926	523	2,090,347	511	2,033,938
February	404	1,591,273	454	1,826,886
January	407	1,671,761	463	1,883,094
December	431	1,706,900	510	2,022,775
November	473	1,902,745	488	1,886,587
October	450	1,920,797	530	2,229,801
September	449	1,960,366	505	2,117,563
August	469	1,889,239	493	1,933,228
July	457	1,813,338	547	2,130,581
June, 1925	521	2,177,995	507	2,103,914

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1926	107	264,754	72	158,858
February	78	184,715	52	113,763
January	76	206,081	52	136,040
December	83	194,283	53	142,885
November	83	216,604	44	116,468
October	74	193,534	49	128,906
September	85	211,019	51	113,257
August	84	197,743	65	146,144
July	96	241,244	57	131,400
June, 1925	107	260,756	67	165,940

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1926	117	356,432	62	173,217
February	92	263,475	42	136,613
January	97	287,335	55	156,167
December	96	270,869	67	210,652
November	115	341,258	59	147,554
October	105	312,455	73	206,347
September	114	328,275	78	196,632
August	136	349,514	104	246,275
July	140	336,982	115	283,558
June, 1925	161	368,009	111	213,985

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1926	34	97,413	31	88,462
February	23	64,150	23	66,660
January	26	78,508	27	81,917
December	31	85,651	29	75,072
November	25	35,616	23	33,194
October	17	27,630	20	34,668
September	19	36,082	22	45,258
August	16	37,391	17	36,191
July	23	48,916	23	54,903
June, 1925	26	37,668	23	38,892

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1926	15	47,557	8	34,025
February	8	29,622	7	30,033
January	5	20,355	6	24,221
December	16	52,660	6	27,149
November	6	16,446	8	26,811
October	9	35,405	6	21,232
September	7	21,260	7	22,410
August	3	14,019	5	17,041
July	12	34,835	9	27,767
June, 1925	8	34,034	7	28,575

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1926	21	85,073	38	134,432
February	23	81,440	33	114,147
January	22	84,722	26	97,068
December	23	86,443	40	144,392
November	28	108,796	37	140,784
October	26	98,371	41	144,397
September	28	103,812	43	158,098
August	16	62,202	23	81,712
July	15	56,181	23	79,132
June, 1925	19	64,684	26	85,839

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1926	120	382,983	119	362,256
February	102	304,714	99	288,640
January	97	302,341	88	264,249
December	105	314,958	109	332,721
November	106	334,997	99	312,705
October	99	302,522	92	293,425
September	93	264,455	109	310,029
August	109	319,469	104	319,035
July	115	345,191	123	350,375
June, 1925	118	343,571	121	353,738

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1926	22	40,160	140	395,033
February	20	48,377	108	298,756
January	26	69,958	96	256,019
December	24	57,907	100	279,570
November	27	78,573	81	254,439
October	26	51,328	91	248,017
September	39	94,940	85	237,623
August	70	183,064	122	348,475
July	61	163,764	131	347,756
June, 1925	81	221,318	152	433,953

Savannah

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1926	43	102,126	41	99,244
February	40	97,908	46	121,792
January	38	103,029	38	106,472
December	37	101,726	35	91,141
November	37	112,158	38	117,064
October	45	125,766	47	126,452
September	50	137,030	39	103,408
August	34	7 ,027	39	87,455
July	38	9 ,332	34	91,981
June, 1925	26	60,788	27	60,924

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1926	102	117,292	90	114,917
February	70	85,607	69	88,229
January	80	110,684	81	110,084
December	89	121,193	88	113,996
November	96	113,222	89	107,091
October	77	91,125	75	90,953
September	76	96,356	78	91,119
August	72	90,106	70	87,924
July	77	94,002	76	91,264
June, 1925	87	95,533	85	95,397

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1926	125	228,481	115	221,022
February	100	153,884	92	188,057
January	109	212,005	78	150,384
December	104	183,941	89	173,371
November	101	191,490	95	185,722
October	88	258,529	84	161,648
September	80	149,289	76	171,432
August	83	172,872	75	152,613
July	89	180,488	80	160,739
June, 1925	86	161,215	79	156,160

Seattle

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1926	38	166,536	45	184,067
February	42	168,308	45	182,920
January	45	182,889	50	204,058
December	47	201,460	55	231,787
November	47	199,055	46	196,343
October	52	203,951	49	207,153
September	42	173,157	43	183,917
August	31	135,105	35	144,874
July	32	137,319	28	130,875
June, 1925	34	143,655	41	174,668

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1926	295	754,863	300	751,054
February	255	717,048	250	691,747
January	241	659,776	243	652,209
December	273	750,625	279	764,022
November	261	645,709	232	629,728
October	252	729,058	276	789,419
September	248	655,367	248	680,446
August	257	675,405	253	664,064
July	265	673,711	262	648,474
June, 1925	263	679,277	249	609,807

Charleston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net. tonnage	—Clearances— No. ships	Net tonnage
March, 1926	18	64,432	20	49,897
February	10	35,629	10	21,945
January	8	27,610	13	27,237
December	14	38,441	10	26,597
November	17	50,093	13	31,111
October	22	68,795	21	55,903
September	13	25,853	22	47,838
August	19	34,089	16	43,588
July	14	30,247	17	39,780
June, 1925	12	23,203	16	49,499

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1926	39	89,426	71	208,388
January	36	92,194	75	235,699
December	38	83,590	97	300,872
November	34	107,440	83	266,458
October	43	98,168	96	302,581
September	33	95,954	72	225,194
August	28	80,524	41	133,058
July	36	100,359	52	141,316
June	47	120,423	57	177,647
May, 1925	46	114,702	53	151,098

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1926	139	371,793	128	305,105
February	119	363,875	111	306,161
January	130	381,785	115	335,041
December	149	392,707	109	310,852
November	181	398,459	123	337,483
October	261	365,552	183	268,611
September	115	284,493	205	259,437
August	161	344,646	160	295,220
July	133	326,692	119	285,624
June, 1925	162	382,186	102	278,294

San Francisco

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
March, 1926	144	571,040	135	511,010
February	133	506,778	134	506,317
January	154	544,882	139	528,315
December	135	532,691	153	593,556
November	124	491,579	142	547,770
October	138	517,798	136	511,844
September	135	487,872	144	535,301
August	154	579,197	154	549,844
July	138	517,798	136	511,844
June, 1925	135	514,900	96	464,024

Port Arthur

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1926	21	65,930	32	70,814
January	23	75,232	32	108,118
December	31	86,254	24	71,883
November	40	117,506	42	120,597
October	30	86,652	32	95,695
September	26	101,387	31	88,654
August	22	66,176	23	68,827
July	27	59,956	34	100,395
June	26	67,251	30	83,972
May, 1925	28	105,707	42	122,871

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There is Only One Tape-Marker

that shows the words "Guaranteed Rope"—that shows the colors red, white and blue—that is backed up by years of advertising emphasizing this *Tape-Marker*. It is the

Columbian Tape-Marker

So established is this well known *Marker* in the Marine field, that a permanent association of Columbian Rope with its *Tape-Marker* guarantee was effected years ago.

You may be absolutely positive that your cordage equipment is excellent if every line aboard contains this *Marker*. The next time you buy rope, ask for Columbian *Tape-Marked* Rope, and be sure it contains the *Marker*.

By Invitation Member

Emblem of BUSINESS CHARACTER

Rice Leaders of the World Association

Represents High Standing in NAME - PRODUCT - POLICY

Columbian Rope Company

322-90 Genesee Street

Auburn, *"The Cordage City"* N. Y.

Branches:— New York Chicago Boston New Orleans

COLUMBIA

COLUMBIAN ROPE CO. AUBURN, N.Y.

TRADE MARK

RED WHITE BLUE GUARANTEED ROPE MADE BY COLUMBIAN ROPE CO., AUBURN, N.Y. ASK FOR "COLUMBIAN" TRADE MARKED ROPE RED WHITE BLUE

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(*Continued from Page* 38)

50 ships of which the following details are given: Four motor tank ships, each of 7500 tons; two refrigerator ships, with passenger accommodation, each 2600 tons, to be used in the Baltic and North Sea; two wood transport steamers, each of 1050 tons; two motor tank ships, each of 3250 tons, for the traffic between Batum and Leningrad; five freight and passenger motor ships, for the Black Sea; one freight and passenger motor ship for the Black Sea; one freight and passenger ship of 2800 tons, as well as a number of smaller vessels, for the Far East, and a floating dock with a capacity of 6500 tons for Leningrad. While, formerly, Russia asked for a ten years' credit, this has been reduced it is stated to two to four years.

* * *

HARLAND & WOLFF report a profit balance for last year, after payment of 6 per cent preference dividend, of £135,469 which is carried forward. The shipbuilding output of the company from its shipyards and engine works at Belfast, Glasgow and Greenock, exclusive of the output from the yards of associated companies, amounted to 113,300 gross tonnage and 88,540 horsepower, as compared with 105,389 gross tonnage and 88,400 horsepower for 1924. The works of the company have been fairly occupied, but the very low prices available have necessitated every effort to reduce the costs of production. The motor ship ASTURIAS, the largest motor liner in service is now on her first voyage, and is giving satisfaction. The company has under construction four other large motor liners equipped with the same type of engine. It appears that the company's diesel engine business is good.

Ocean Freight Rates

Per 100 Pounds Unless Otherwise Stated

Quotations Corrected to April 22, 1926 on Future Loadings

NOTE: FREIGHT RATES STEADY WITH BUSINESS FAIR

New York to	Grain	Provisions	Cotton (H. D.)	Flour	General cargo cu. ft.	General cargo 100 lbs.	††Finished steel	REMARKS Freight Offered
Liverpool	1s 6d	$0.50	$0.30	0.18	$0.40	$0.75	$7.00T	Dull
London	1s 6d‡	0.50	....	0.20	0.40	0.75	7.00T	Light
Oslo	$0.13	0.45	0.50	0.27	0.42½	0.85	7.00T	Good
Copenhagen	0.13	0.45	0.40	0.26	0.42½	0.85	7.00T	Good
Hamburg	0.10	0.35	0.35	0.18	0.37½	0.75	8.00T	Slow
Bremen	0.10	0.35	0.40	0.18	0.37½	0.75	8.00T	Light
Rotterdam and Amsterdam	0.10	0.32½	0.45	0.18	0.35	0.70	7.50T	Fair
Antwerp	0.11	0.32½	0.35	0.18	0.35	0.70	7.50T	Fair
Havre	0.10	0.50	0.35	0.27½	0.40	0.75	8.00T	Very slow
Bordeaux	0.10	0.50	0.35	0.27½	0.40	0.75	8.00T	Very slow
Barcelona	....	12.00T	0.30	10.00	—12.00T—		8.00 to 15.00T	Fair
Lisbon	0.20	0.65	0.40	7.00T	—20.00T—		7.00T	Fair
Marseilles	0.15	0.55	0.30	6.00	—20.00T—		5.00T	Poor
Genoa	0.13	12.50	0.40	7.00	—20.00T—		10.00T	Fair
Naples	0.13	12.50	0.40	7.00	—20.00T—		10.00T	Fair
Constantinople	0.27	17.00T	0.75	0.40	—20.00T—		9.00T	Slow
Alexandria	....	17.00T	0.75	0.40	—20.00T—		9.00T	Fair
Algiers	....	0.75	0.50	0.40	—20.00T—		10.00T	Poor
Dakar	....	15.00	....	14.00T	—21.00T—		10.50T	Fair
Capetown	9.00T	18.00	....	13.00T	—20.00T—		11.00 to 18.00T	Good
Buenos Aires	....	20.00T	....	....	—20.00T†		8.00T	Good
**Rio de Janeiro	....	22.00T	....	8.00T	20.00 to 22.00T†		7.00 to 7.70T†	Good
Pernambuco	....	22.00T	....	9.00T	—22.00T—†		9.70T†	Good
Havana	0.32*	0.50	....	0.38*	0.61*	1.33*	10.20*	Fair
Vera Cruz	0.35	0.30	0.35	0.25	0.52½	1.05	0.30 to 0.35	Fair
Valparaiso	....	1.07	....	0.70	0.45	0.80	10.00T	Very good
San Francisco	....	0.40 to 0.70	....	0.50 to 1.10	....	....	0.30 to 1.00	Fair
Sydney	....	18.00T	1.25	1.18T	18.00-24.00T		9.00-12.00T	Dull
Calcutta	....	14.00T	0.45	10.00T	—16.00T—		10.00T	Fair

T—Ton. ‡Per quarter of 480 lbs. †Landed. ††Heavy products limited in length. *Extra charge for wharfage.
**Plus $1.00 surcharge on all rates to Rio de Janeiro on account of congestion.

From North Pacific Ports to	Lumber Per m. t.
San Francisco	$5.00
South California	5.00 to 6.00
Hawaiian Islands	9.50 to 12.00
New Zealand	17.00 to 18.00
Sydney	13.00 to 13.50
Melbourne-Adelaide	13.50 to 14.00
Oriental Ports	8.50 to 10.00
Oriental Ports (logs)	12.50 to 14.00
Peru-Chile	12.50 to 14.00
South Africa	17.00 to 18.00
Cuba	16.00
United Kingdom	75s to 90s
United Kingdom (ties)	70s to 80s
Baltimore-Boston range	$14.00 to 15.00
Florida Range	No rates
Buenos Aires	14.00
	Flour and Wheat
U. K. and Continent (gross ton)	25s to 30s
Oriental Ports (net tons)	$4.00 to 4.50

Principal Rates To and From United Kingdom

	s	d		s	d
Grain, River Plate to United Kingdom	17	0	Pig iron, United Kingdom to New York or Philadelphia	9	6
Coal, South Wales to Near East	11	9	Iron ore, Bilbao to Cardiff	6	0
Coal, United Kingdom to Buenos Aires	18	3	Iron ore, Huelva to Phila. or Balto	13	6
Manganese Ore, Poti to Philadelphia	$3.95				

NOTE: Lighterage rates on fuel in New York reduced from 6½ to 5½c per barrel.

Bunker Prices

At New York

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
July 20, 1925	4.90@6.00	1.75	5.50c
Aug. 17	5.00@6.00	1.71½	5.50
Sept. 19	5.50@6.00	1.71½	5.00
Oct. 17	5.00@6.00	1.70½	5.00
Nov. 18	5.50@5.60	1.70½	5.00
Dec. 18	5 60	1.70½	5.00
Jan. 2	5.50@6.25	1.75@1.80	5.25
Mar. 18	5.60@5.80	1.80½	5.50
Apr. 22, 1926	5.25@5.60	1.80@1.81½	5.75

At Philadelphia

	Coal trim. in bunk per ton	Fuel oil alongside per barrel	Diesel oil alongside per gallon
Aug. 17, 1925	5.00@5.80	1.56@1.71½	5.15@5.29c
Sept. 19	5.25@5.50	1.55@1.61½	5.00
Oct. 17	5.25@5.50	1.71½@1.74½	5.15@5.65
Nov. 18	5.40@5.65	1.71½@1.74½	5.15@5.25
Dec. 18	5.15@5.50	1.71@1.74½	4.89@5.15
Jan. 20	5.50@6.25	1.71@1.79	5.00@5.65
Feb. 18	5.80	1.78@1.86½	5.14@5.50
Mar. 18	5.00@5.25	1.80@1.86½	5.40@5.65
Apr. 22, 1926	5.25	1.77@1.86½	5.90@5.93

Other Ports

Boston, coal, per ton...$7.27
Boston, oil, f. a. s., per barrel...$1.81
Hampton Roads, coal, per ton, f.o.b., piers... 4.40
April 9 — Cardiff, coal, per ton...14s 0d
London, coal, per ton..25s 0d
Antwerp, coal, per ton.21s 6d
Antwerp, Fuel oil, per ton.77s 6d
Antwerp, Diesel oil, per ton...97s 6d
British ports, Fuel oil...72s 6d
British ports, Diesel oil. 87s 6d

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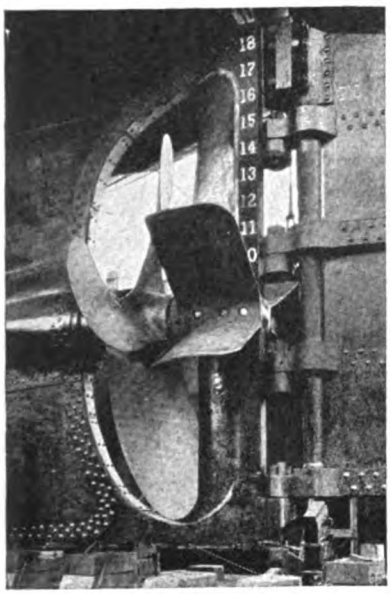
The Contra-Propeller

Saves from 10 to 20 per cent indicated horsepower



A six-blade Contra-Propeller on a single-screw vessel

THE endorsement recently accorded the Contra-Propeller by the American Steamship Owners' Association, is a fine testimonial to its efficiency.

The success which has resulted from its application on numerous vessels shows abundant evidence of real worth and economy.

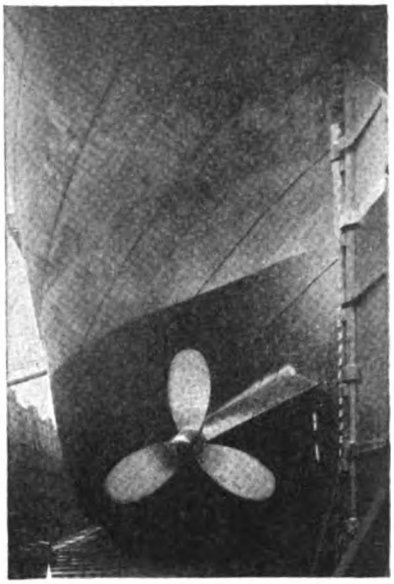
The Contra-Propeller as originally designed was primarily intended for use in single-screw vessels of moderate speed, but experience has shown its practical application is by no means confined to the single-screw type vessel.

So far, about 175 European and 11 American ships have been fitted with Contra-Propellers, among them being a number of vessels with twin screws. The entire group covers a wide range of types, the vessels varying in size from small tugs to large cargo and passenger ships.

From 10 to 20 per cent saving in indicated horsepower has been realized in actual operation. This saving, together with the increase in speed, results in very material saving in fuel.

For vessels of moderate speed, the introduction of the Contra-Propeller marks the most important single improvement in propulsive efficiency and resultant economy which has been effected in recent years.

Bethlehem is the sole manufacturer of the Contra-Propeller in the United States, under license from the Goldschmidt Corporation, 15 William St., New York City, exclusive representatives in the United States and Canada.



A Contra-Propeller is installed abaft each propeller strut of this twin-screw vessel

American vessels equipped with the Contra-Propeller

S. S. NORFOLK
S. S. SUFFOLK
Coastwise Transportation Co.
S. S. SANTORE
S. S. LEBORE*
S. S. MARORE*
S. S. BETHORE*
Ore Steamship Corporation
S. S. STEEL NAVIGATOR
S. S. FAIRFIELD CITY
Isthmian Steamship Lines
S. S. BYLAYL
Pocahontas Navigation Co.
S. S. DIRIGO
The Texas Company
S. S. SAMUEL Q. BROWN
Tidewater Oil Company

American vessels with Contra-Propellers on order

S. S. FLORENCE LUCKENBACH
Luckenbach Steamship Company
S. S. ELISHA WALKER
Pan-American Petroleum and Transportation Company
M. S. STEEL CHEMIST
M. S. STEEL ELECTRICIAN
Isthmian Steamship Lines
M. S. CUBORE S. S. FELTORE
S. S. CHILORE* S. S. FIRMORE
S. S. STEELORE*
Ore Steamship Corporation
S. S. CALISTOGA
Monticello Steamship Company
S. S. LEHIGH
Bethlehem Transportation Co.
S. S. JONANCY S. S. FREEMAN
Pocahontas Steamship Company
S. S. GLENMOHR S. S. GLENEAGLES
S. S. GLENIFFER
Great Lakes Transportation Co.
TUG JAMES EDWARD TUG LYDON
Great Lakes Dredge and Dock Co.
S. S. LEVISA United Fruit Company
S. S. LIGHTBURNE
The Texas Company
S. S. DIXIE ARROW
Standard Transportation Company
S. S. JOHN D. ARCHBOLD*
Standard Oil Co. of N. J.

***Twin-Screw Vessels**

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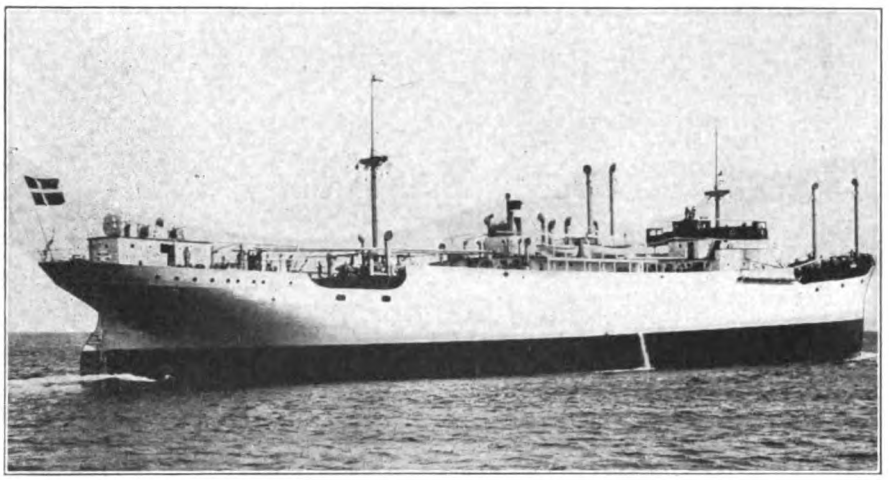


THE NORWEGIAN TWIN SCREW MOTORSHIP CHR. KNUDSEN ATTAINED A SPEED OF 12 KNOTS ON TRIALS

(*Continued from Page* 18)

set and is situated on top of the aft deckhouse. The crew is accommodated aft in well-lighted and well-ventilated rooms and combined wash and bathrooms are fitted for their use.

The galley is of the latest type with self-contained oil fired range capable of cooking for 45 persons. There is a large refrigerated provision room of about 800 cubic feet, capable of keeping a temperature of from plus 3 degrees C. for meat to minus 8 degrees C. for vegetables.

The vessel is heated by steam radiators, and electric light is installed throughout. A steam-fire extinguishing system is fitted according to the requirements of the Norwegian laws.

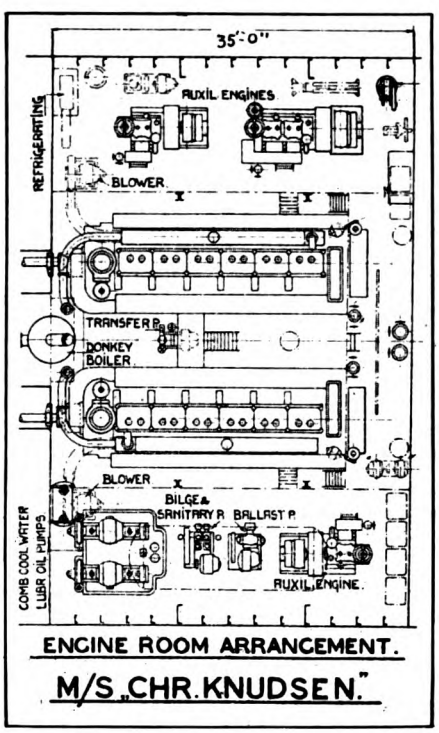
An oil-fired cross tube boiler of about 80 square feet heating surface and constructed for a working pressure of 70 pounds, fitted in the engine room, supplies the steam to the heating installation and for fire extinguishing.

Diesel Propelling Machinery

There are two four-cycle single acting diesel engines of B. & W. standard light-built type for twin-screw vessels, the leading particulars being as follows:

Number of cylinders	**6**
Revolutions per minute	**150**
Total I.H.P. Two Engines	**2500**

The square cylinder covers, subjected to the whole compression and combustion pressure in the cylinders are strongly constructed; and they



ENGINE ROOM ARRANGEMENT.

M/S „CHR. KNUDSEN."

are bolted together by means of vertical flanged-joints and long steel through stay bolts from the covers carried down through the columns to the iron girders aft of the bedplate close to the main bearings.

The cam shaft is located at the top of the cylinder cover, and the valves are operated direct through rocker arms. Two blowers are fitted aft on platforms near the inlet air intake pipe for supercharging the inlet air. The blowers supply the air at 2500 revolutions per minute. There is one blower for each main engine but no stand-by, this being of minor importance for engines of the four-cycle type as in case of a breakdown of the blower the engine will continue to work on natural draft, the output only being reduced by about 10 per cent.

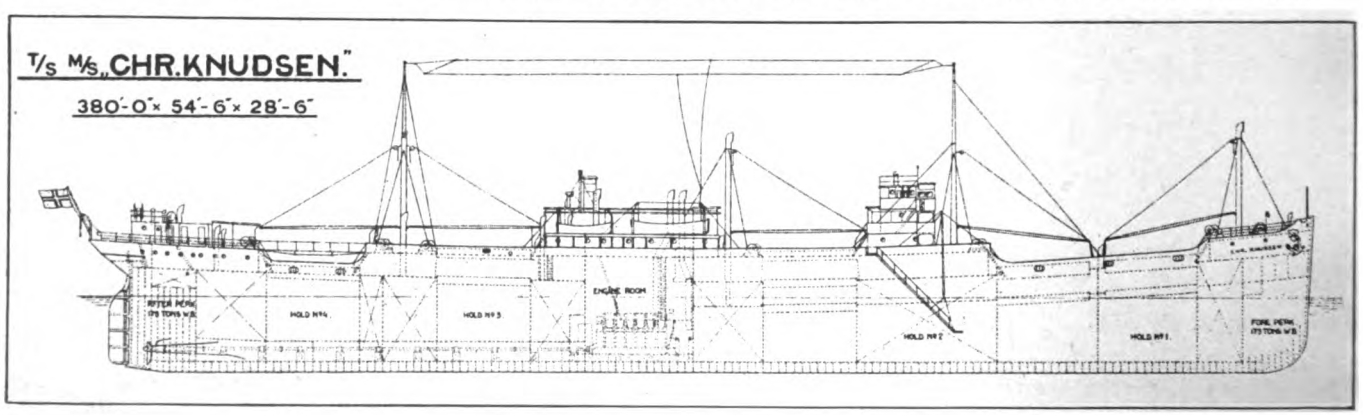
There are two single cylinder auxiliary diesel engines and one twin cylindered, developing respectively 50 and 100 brake horsepower at 400 to 450 revolutions per minute. They are direct-coupled to two of 33 kilowatts and one of 86 kilowatts generators at a voltage of 220 volts and 400 revolutions per minute. The dynamos supply the necessary current for all the motors, and by means of a 12-kilowatt rotary transformer, the current is made suitable for lighting.

The circulating water and lubricating oil is supplied by special Burmeister & Wain type electrically driven pumps. The auxiliary plant in the engine room further comprises a combined lubricating oil pump, acting as a stand-by and a fuel oil service pump, electrically driven with the motor placed in the center and arranged in a way so that the pump may be cut out or in according to wish. There is also a 150-ton electrically driven ballast pump and a bilge and sanitary pump.

Machinery Weights

From the following figures it will be observed that an overall low machinery weight has been attained:

	Tons
Main engines	**164.0**
Auxiliary engines	**31.0**
Auxiliary machinery	**11.0**
Reservoirs	**20.0**
Shafting, complete with all extras	



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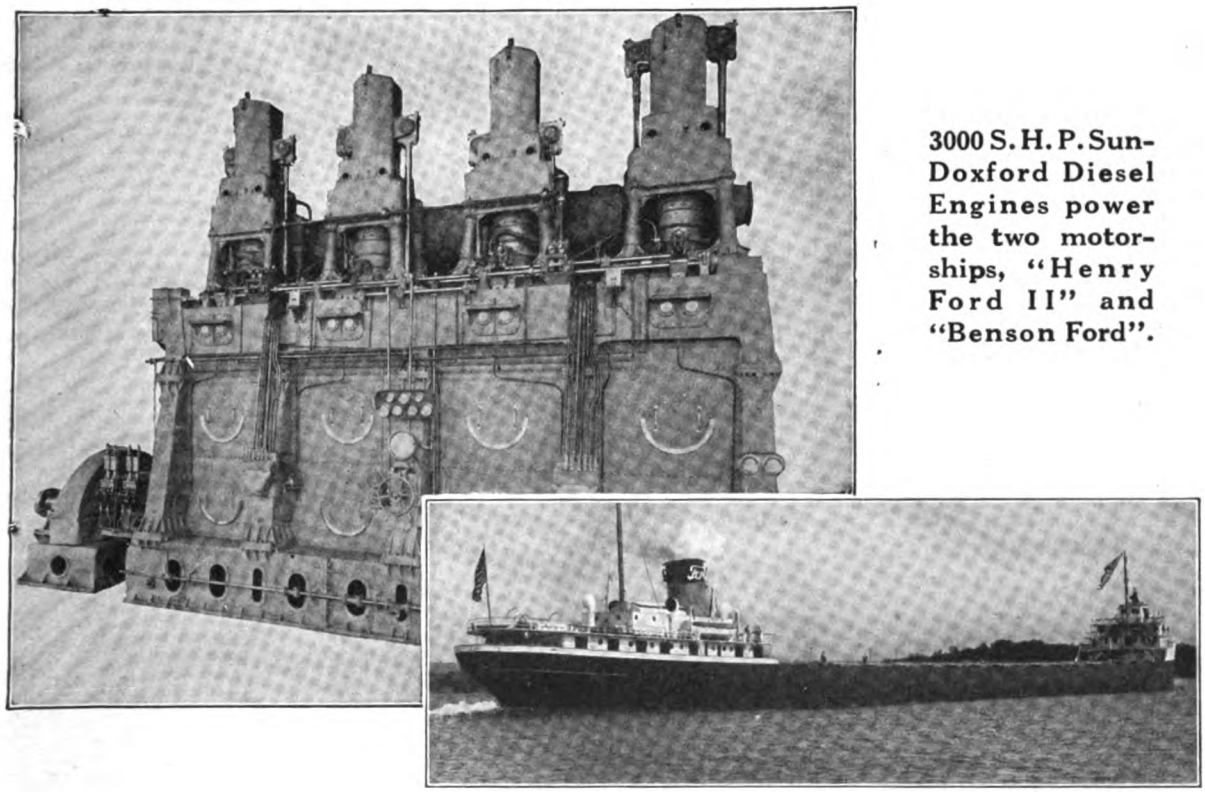
SUN SHIPBUILDING & DRY DOCK COMPANY

Builders of

SUN-DOXFORD DIESEL ENGINES

The Engines that Power

"HENRY FORD II" *and* "BENSON FORD"



3000 S.H.P. Sun-Doxford Diesel Engines power the two motorships, "Henry Ford II" and "Benson Ford".

M. S. "Henry Ford II"

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including spare propeller	**39.0**
Ladders, gratings, floor plates, lifting gear, spare parts, engine room ventilators, telegraph gears, special tools	**19.0**
All piping clear of engine and including bilge and ballast piping, bottom valves	**18.0**
All electrical material inside engine room	**3.5**
Water in piping	**3.5**
Total in tons	**309.0**

A successful trial trip of the vessel was held on Aug. 18 in the Sound of Copenhagen, in rough weather and high wind. A mean speed of 12.08 knots with a horsepower of about 2600 was attained.

SINGLE SCREW CARGO MOTORSHIP MULCRA BUILT IN DENMARK BY THE SVENDBORG SHIP & ENGINE BUILDING CO., SVENDBORG, DENMARK, FOR THE ADELAIDE STEAMSHIP CO., ADELAIDE, AUSTRALIA

Single Screw Motorship Mulcra

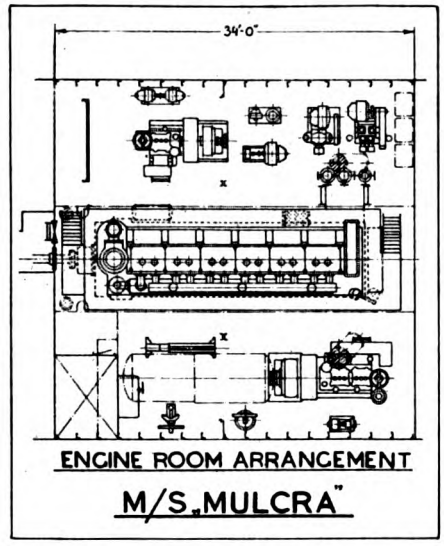
The single screw motorship Mulcra was built by Svendborg Ship & Engine Building Co., Svendborg, Denmark, for the Adelaide Steamship Co., Adelaide, Australia, to Lloyd's special survey, with class 100 A. 1 and in accordance with British board of trade regulations and the Australian navigation act. She is of the raised quarter-deck type with cruiser stern and the principal dimensions are:

Length overall, feet	**225**
Length between p. p.	**215**
Breadth molded, feet	**34**
Depth molded, feet ins.	**15 6**
Height of decks, feet.	**7**
Height of quarter deck, ft. ins.	**3 9**
Deadweight in tons, about	**1450**
Gross tonnage	**1168**

From the general arrangements drawing it will be seen that the Mulcra has two large holds with engine room amidship. The cellular double bottom, which is designed and constructed for the carriage of fuel oil or water ballast is divided into five watertight compartments.

The total water ballast capacity of the vessel, including fore and after peaks, is 341 tons, and the oil fuel capacity is 227 tons. The capacity of the holds is 79,400 cubic feet in grain and 74,200 cubic feet in bales. Particular attention was given to the cargo handling facilities as the ship is designed specially for coastal service.

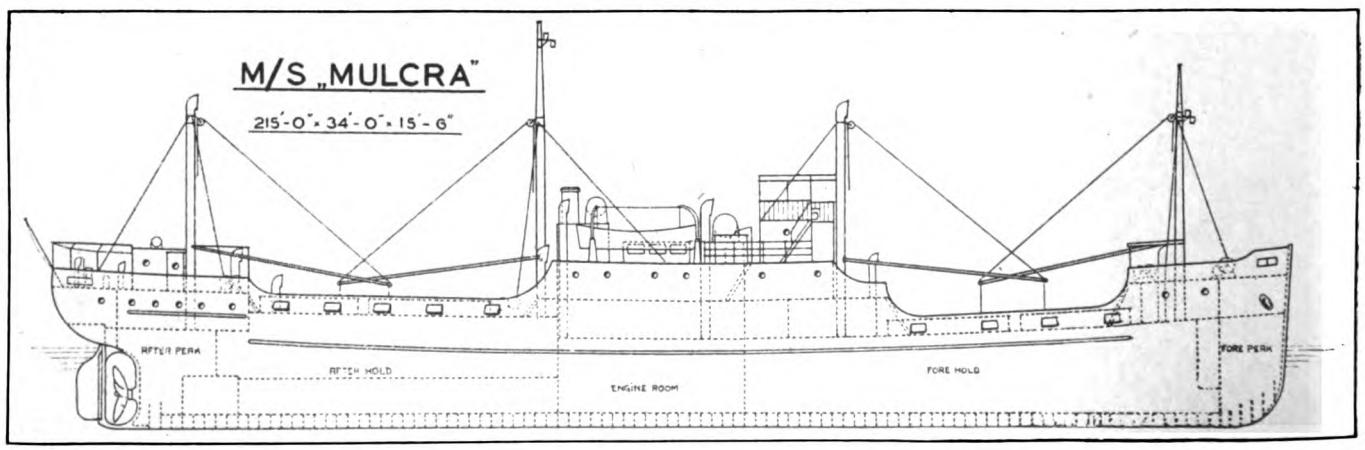
Each hold has two hatches of 16 feet width and a mean length of 20 feet. There are two steel tubular derricks to each hatch and each derrick is capable of lifting 5 tons. The derricks are served by eight 3-ton winches. The winches as well as the windlass are all electrically driven and were supplied by Thomas B. Thrige, Odense, Denmark. The steering gear, which was supplied by Brown Brothers, is of the electric hydraulic type and is controlled by telemotor from the bridge.



Living Accommodations

Accommodations are provided for the officers and the engineers in the bridge erections around the engine casing. The saloon or messroom for the captain and deck officers are also located here. The quarters for the captain, and the chart-room are located in a house on top of the bridge house, forming the navigation bridge. The crew is accommodated in the poop and separate mess-rooms are provided for petty officers, sailors and motormen.

Changing room and wash rooms according to the Australian navigation act are arranged in a separate deckhouse on the poop. The hospital with separate bath and toilet is arranged in the forecastle. The sanitary arrangements for officers and crew throughout the vessel are in accordance with latest practice and the service along the coast of Australia. An ice box is arranged in the forecastle.



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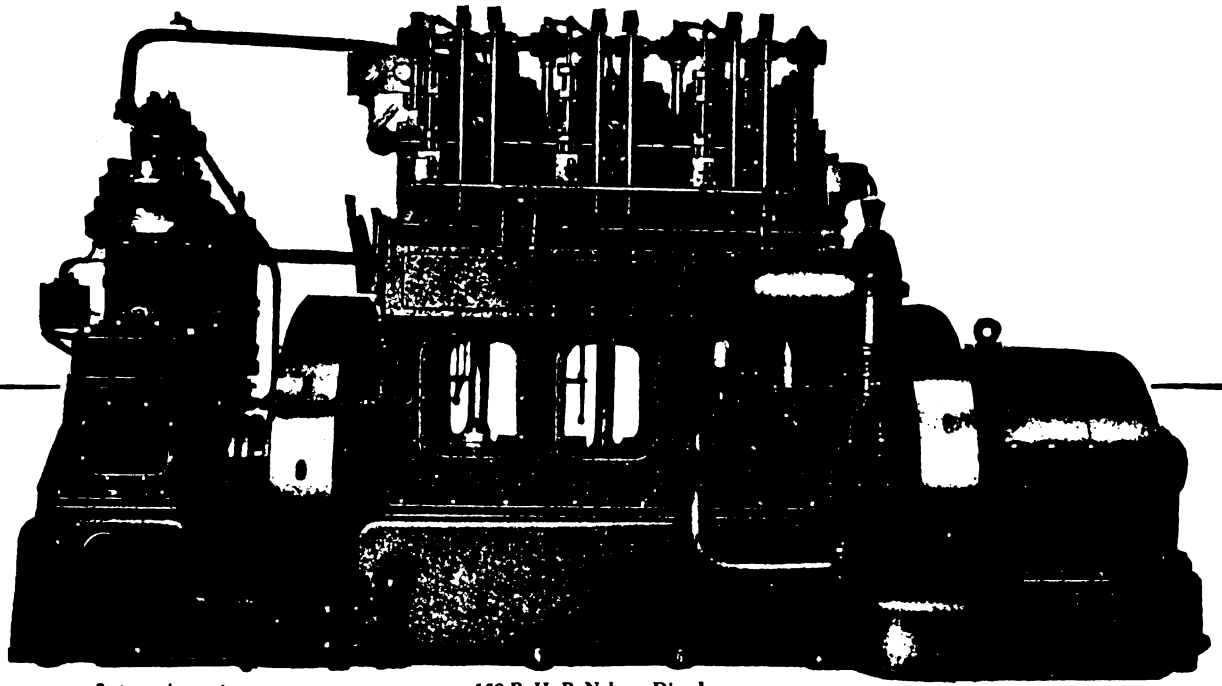

3-stage air compressor
150 cu. ft. free air per minute

150 B. H. P. Nelseco Diesel Engine, Type 3 MI-18

100 K. W. Electro-Dynamic DC Generator

Auxiliary Ship Set for New Standard Oil Tanker

The Standard Oil Company of N. J. has recently purchased three Nelseco auxiliary generator units, similar to the one pictured above, for the tanker, "E. T. Bedford."

These units are now being installed and will be used to supply auxiliary power, light and starting air aboard ship.

These auxiliary outfits have been so successful that three similar units are now being supplied to the Gulf Refining Company for use on a new 20,000 ton Diesel tanker now building at the Federal Shipbuilding and Dry Dock Co.

If you are interested in Diesel engines, write for Pamphlet MR—or better still—consult with a Nelseco engineer regarding your power problems.

Nelseco facilities include both conversion from steam to Diesel power and new shipbuilding construction.

Nelseco Diesels are built under M. A. N. patents; in 4-cycle, single-acting type, from 100 to 850 H. P.; in 2-cycle, double-acting type, from 1,000 to 10,000 H. P. mechanical or air injection; suitable for direct current, alternating current, rope, belt or direct drive.

A 180 H.P. Nelseco Diesel is conveniently placed for your examination at our sales office.

PORT ELCO

247 Park Ave., New York, N.Y.

Demonstrations made on appointment

NEW LONDON SHIP & ENGINE COMPANY
Groton, Conn., U. S. A.

NELSECO

Original licensees from and collaborators with M.A.N. since 1910

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Percolators for boiling water for tea are provided in the galley and in crews and officers messrooms. The heating as well as the lighting is done by electricity and the galley, which is situated in the bridge house is oil fired.

The propelling machinery consists of one six-cylinder four-stroke single acting Diesel engine of Burmeister & Wain new light built type for single screw vessels. The piston stroke is long compared with the cylinder diameters to give a comparatively slow running engine. The main particulars of the engine are as follows:

Cycle of operation, stroke	4
Number of cylinders	6
Revolutions per minute	125
Indicated horsepower	1000
Stipulated sea speed, knots	10

The daily fuel oil consumption is about 3 tons giving the vessel a cruising radius of about 20,000 miles, which is quite sufficient for her maiden voyage from Denmark to Australia.

All the auxiliary machinery in the engine room as well as the deck machinery is electrically driven, the current being supplied by two dynamos, one of 33 kilowatts and one of 66 kilowatts driven by auxiliary Diesel engines, designed and constructed by Burmeister & Wain.

The current for power purposes is 220 volts. For lighting and heating purposes this is transformed to 110 volts. Any one of the dynamos is sufficient to supply the necessary current required for normal working at sea, but both have to be in operation when maneuvring in and out of harbor or when loading and discharging cargo.

Contractor's Sea Trials

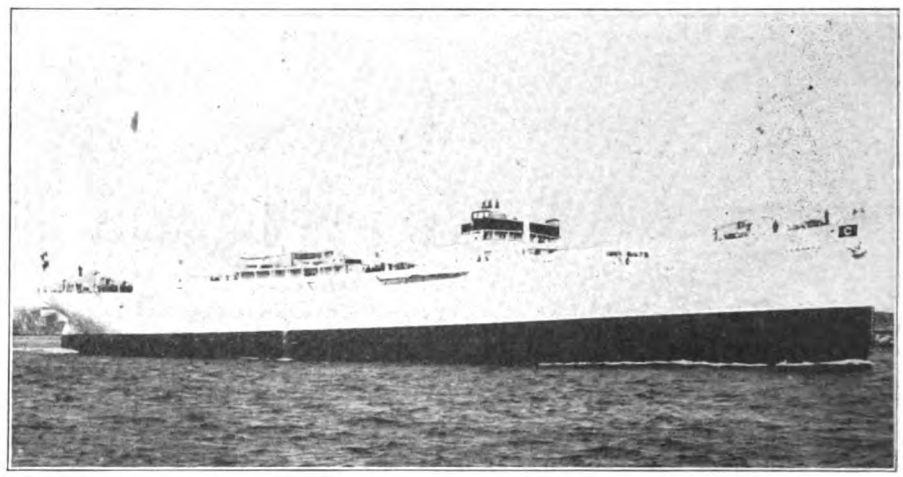
The trial trip of the M. S. MULCRA was run on Sept. 27, 1925 in the Sound at Copenhagen, and a mean speed of 11.5 knots was attained with a fuel consumption of 142 grams (0.31 pounds) per indicated horsepower per hour. This fuel consumption included the consumption of the auxiliary engines producing the necessary current for driving the auxiliary machinery, the steering gear and the electric lighting plant.

The greatest speed obtained on the trial trip was 11.67 knots, with the engine developing 1177 indicatd horsepower at 138½ revolutions per minute. The consumption in actual service should be considerably lower, taking into consideration that the 66-kilowatt Diesel generator was running during the trials whereas the owners intend to operate the vessel in the open sea without running any of the auxiliary engines. All pumps for the operation of the main engine, and also the bilge and sanitary pumps are attached to and driven by the main engine, and the steering gear is fitted so that it can be worked either by hand or by power, which means a considerable saving in fuel oil consumption.

The trials were carried out in the presence of Mr. Oswald, representing the Adelaide Steamship Co., and were a success in every respect. After the trial and on the same day, the MULCRA left Copenhagen arriving at Blyth on Oct, 1, where provisions and a load of coal were taken on. The next day the vessel proceeded direct to Port Adelaide around South Africa.

Twin Screw Motorship Segundo

The twin screw motorship SEGUNDO was built and engined by Burmeister & Wain, Copenhagen, to the order of Ivarans Rederi, Akts., Oslo, Norway.



TWIN SCREW CARGO MOTORSHIP SEGUNDO BUILT BY BURMEISTER & WAIN FOR IVARENS REDERI AKTS., OSLO, NORWAY, FOR THE SOUTH AMERICAN TRADE

The principal particulars of the vessel are as follows:

Length between p. p. ft. ins...	367 0
Breadth molded ft. ins.	53 6
Depth to upper deck ft. ins.	27 6
Depth of double bottom ins.	41
Gross tonnage	4414
Net register tonnage	2668
Capacity bales cu. ft	400,900
Capacity grain cu. ft.	428,200
Deadweight tons	7800
Draft loaded ft. ins.	23 11

The ship is classed in the Norwegian Veritas 1 A 1 single deck type with poop, bridge and forecastle. She has six watertight bulkheads and four cargo holds, two forward and two abaft the engine room. The double bottom extending the entire length of the ship is fitted for the carriage of either oil fuel or water ballast, the total capacity of the former being 1060 tons and the capacity of the latter 1435 tons including the fore and aft peaks.

Special attention has been given to secure quick handling of cargo. The holds are provided with five large cargo hatches. For each hatch there are two steel tubular derricks and the derricks are served by six 3-ton winches and four 5-ton winches.

The winches are all electrically driven and were supplied by Thomas B. Thrige, Odense, Denmark. The windlass is of Emerson Walker's make, electrically driven and suitable for 2 3/16 inches chain cables. The steering gear is of the Vickers electro-hydraulic type and is controlled from the bridge by means of a telemotor.

In the deckhouse round the engine casing on the bridge, accommodation is provided for the deck officers and engineers as well as for the boatswain, carpenter and cooks. The officers messroom, bath, hospital and a galley with an oil fired range, are also located here.

In the forward deckhouse on the bridge the spacious saloon is tastefully fitted out with polished mahogany panels and white enameled walls and ceiling. Accommodation is also provided here for a few passengers and for the steward. From the passage outside the saloon a staircase leads up to the captain's quarters panelled in white enamel, and to the owners cabin, a large room, finished in polished mahogany. The wireless station, fitted with a 1½-kilowatt Marconi set, as well as the wireless operator's cabin are located in a steel house in front of the motor room casing on the boat deck.

The crew is accommodated in the poop in well lighted steam heated and well ventilated large rooms, two men in each as required by the Norwegian laws, with large separate messrooms for the seamen and motormen. The washrooms and toilets for the crew are located in a steel house on the poop deck.

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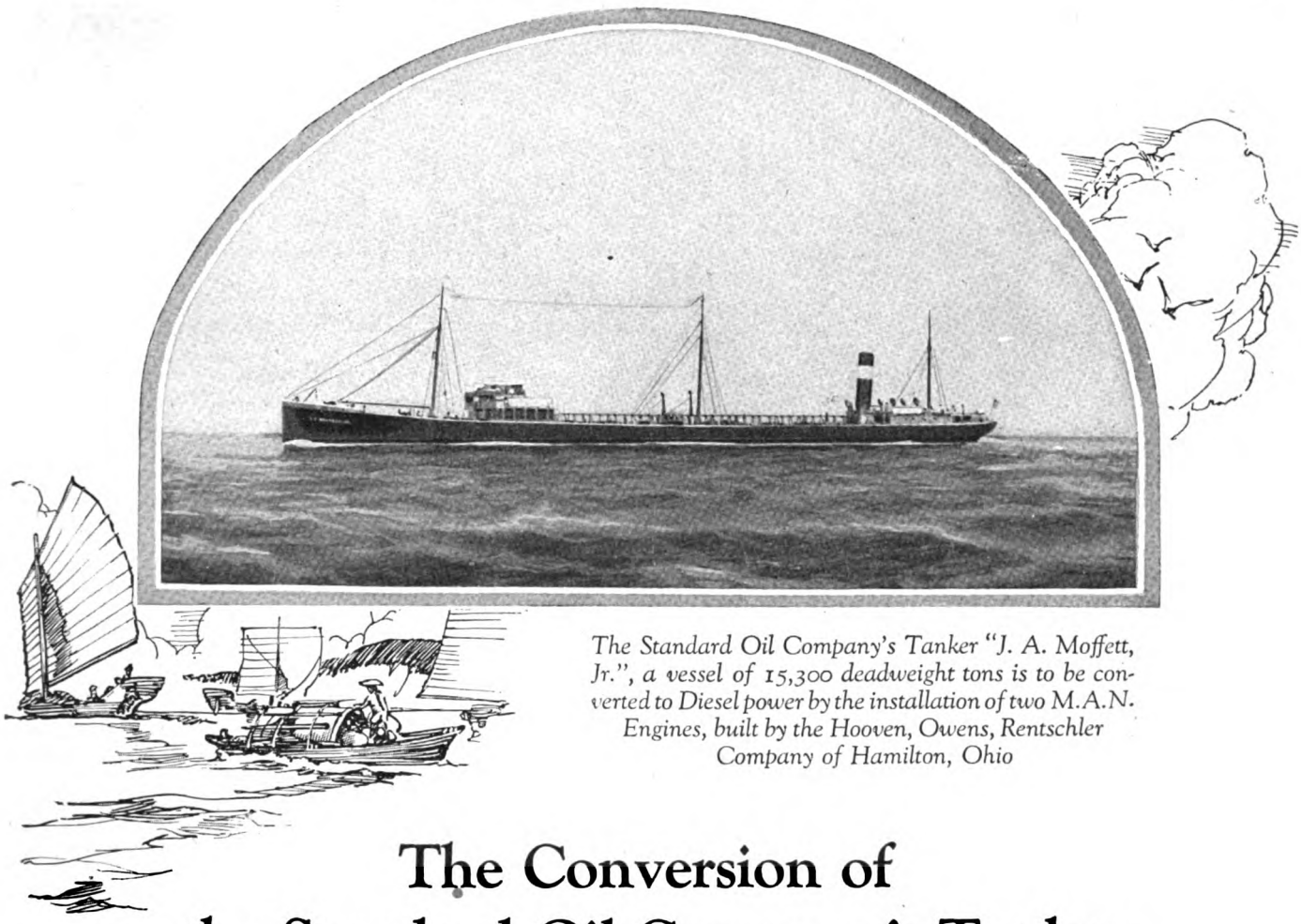

The Standard Oil Company's Tanker "J. A. Moffett, Jr.", a vessel of 15,300 deadweight tons is to be converted to Diesel power by the installation of two M.A.N. Engines, built by the Hooven, Owens, Rentschler Company of Hamilton, Ohio

The Conversion of the Standard Oil Company's Tanker "J. A. Moffett, Jr."

from steam to Diesel drive is to be carried out at the Tietjen and Lang plant of this Organization in Hoboken, N. J.

The very complete facilities of this Yard for conversion work and engine installation are unsurpassed on the Atlantic coast.

Performance and delivery are assured through the wide experience of this Organization in important marine work for many years.

TODD SHIPYARDS CORPORATION
25 Broadway, New York City

PLANTS

Robins Dry Dock & Repair Co.
Erie Basin, Brooklyn, N. Y.

Tietjen & Lang Dry Dock Co.
Hoboken, N. J.

Todd Dry Dock Engineering & Repair Corporation, Foot of 23rd St., Brooklyn, N. Y.

Todd Engineering, Dry Dock & Repair Co., New Orleans, La.

Todd Dry Dock & Construction Corporation, Tacoma, Washington

Todd Dry Docks, Inc., Harbor Island 16th Ave., S. W., Seattle, Wash.

Todd Shipbuilding & Dry Dock Co., Inc., Mobile, Ala.

Todd Oil Burners, Ltd.
Cory Buildings, Fenchurch St.
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Other Installations of Diesel engines in:

Motorship Boxer
Motorship Patterson
Motorship Fordonian
Motorship Admiral Peary
Motor tug Texaco 125
Motor yacht Alcyone

Twenty-Two Floating Dry Docks
Two Graving Docks
Twelve Shipways

TODD
NEW YORK, U.S.A.

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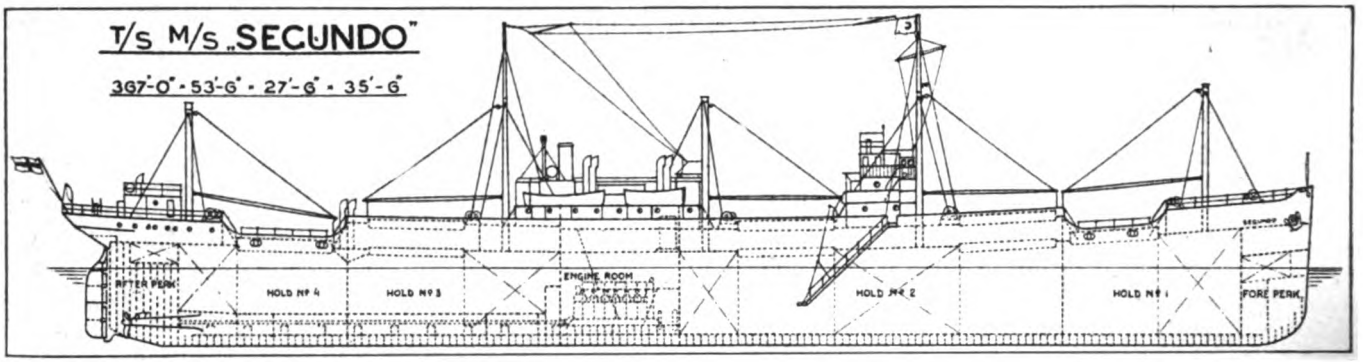

Arrangements throughout the vessel are in accordance with latest practice. Large refrigerated provision rooms and an ice making machine are provided. Electric light is installed throughout and a water as well as a steam fire-extinguishing system is fitted according to the requirements of the Norwegian laws. An oil fired donkey boiler of the cross tube type placed in the engine room supplies the steam for heating the quarters.

Diesel Propelling Machinery

The propelling machinery consists of two 6-cylinder, four-cycle single acting and forced lubricated diesel engines of Burmeister & Wain's new light-built type for twin screw vessels.

The main particulars of the engines are as follows:

Cycle operation, strokes	**4**
Number of cylinders	**6**
Revolution per minute	**150**
Indicated horsepower	**2300**
Sea speed in knots	**10½**

The daily fuel oil consumption per 24 hours is about six tons giving the vessel a cruising radius of about 50,000 miles.

All the auxiliary machinery in the engine room, as well as the deck machinery, is electrically driven. The current is supplied by three dynamos, two of 33 kilowatts and one of 66 kilowatts driven respectively by two single cylindered and one twin-cylindered auxiliary Diesel engines designed and constructed by Burmeister & Wain. The voltage for power is 220 volts, and for lighting this is transformed down to 110 volts by means of a rotary transformer. Any one of the dynamos is sufficient to supply the current required for normal working at sea, while only two are needed in operation with all the winches working at full power.

The trial trip of M. S. SEGUNDO was run on Sept. 5, 1925 in the Sound of Copenhagen, and over the measured mile the following results were obtained under difficult weather conditions:

Indicated horsepower	**2590**
Revolutions per minute	**160.5**
Mean speed in knots	**11.24**

The trials were a success in every respect. The M. S. SEGUNDO is intended for service between North and South America.

Tanker British Petrol Single Screw Diesel

The single screw motor tank ship BRITISH PATROL was built and engined by Swan, Hunter & Wigham Richardson Ltd., at their Neptune works, Newcastle-on-Tyne, to the order of the British Tanker Co. Ltd. of London.

The vessel was constructed for the carriage of oil in bulk. She is 454 feet in length by 57 feet beam and was built to the highest class in Lloyds register. She will carry about 10,100 tons total deadweight on a draft of 26 feet 8 inches.

The oil cargo is carried in 20 hold tanks and 10 summer tanks. There is also a hold forward in which ordinary cargo can be carried. The installation for dealing with the oil cargo is very complete, including two cargo oil pumps, each discharging 300 tons per hour, in the main pump room, and a smaller pump room forward, containing the ballast pump and oil fuel pump.

The oil fuel for the engines is carried in a cross bunker, in the double bottom both forward and aft, and in settling tanks, their total capacity being 740 tons.

Can Accommodate Eight Passengers

Accommodation is fitted amidships for captain, officers and passengers. The captain's sitting room, bedroom and bathroom are arranged on the upper bridge, and in the same house are the rooms for the wireless operators. On the flying bridge above this house are situated the chartroom and Marconi room, the flying bridge being protected by teak sheathing and fitted with two clear view screens for the safe navigation of the vessel.

A large dining saloon is fitted on the bridge deck and near it on the same deck are a smoking room, staterooms for the deck officers, four rooms fitted up for the accommodation of eight passengers, and bathrooms. On the poop deck aft there is excellent accommodation for the engineer officers, including messroom, staterooms and bathrooms.

On the upper deck forward are rooms for the seamen and firemen with separate dining rooms, while amidships are placed various stores, a hospital and a carpenter's shop. Aft are rooms for waiters, electricians, cooks, and apprentices.

The propelling machinery consists of a single screw set of Swan, Hunter & Wigham Richardson's internal combustion engines of the Neptune two-cycle, single-acting port scavenging type, which have proved their reliability under severe sea-going conditions. There are eight cylinders, each 24 inches in diameter by 50 inches stroke, the total power being 3200 brake horsepower.

In the Neptune oil engine the builders have paid every attention to simplicity of design and accessibility of all parts. The whole engine can be operated by one man from the control station on the lower platform. Among the most noticeable features of the design, mention should be made of the scavenging pumps placed at the back of the engine and driven by means of levers from the engine crossheads. The circulating water pumps, bilge pumps and the lubricating pump are similarly driven. The built-up crankshaft, the main bearings, crossheads and pistons have all been designed with a view to obtaining the most efficient lubrication possible and easy accessibility.

Two marine type steam boilers are installed, these being necessitated by the steam cargo oil pumps and certain of the engine room auxiliaries which are steam driven. The steering gear is electrically driven, as also are those engine room auxiliaries continually in use at sea, so that the ship may be independent of steam for propulsive purposes. Electric power is supplied by two 60 kilowatt generators of Vickers make, driven by two 90 brake horsepower engines.

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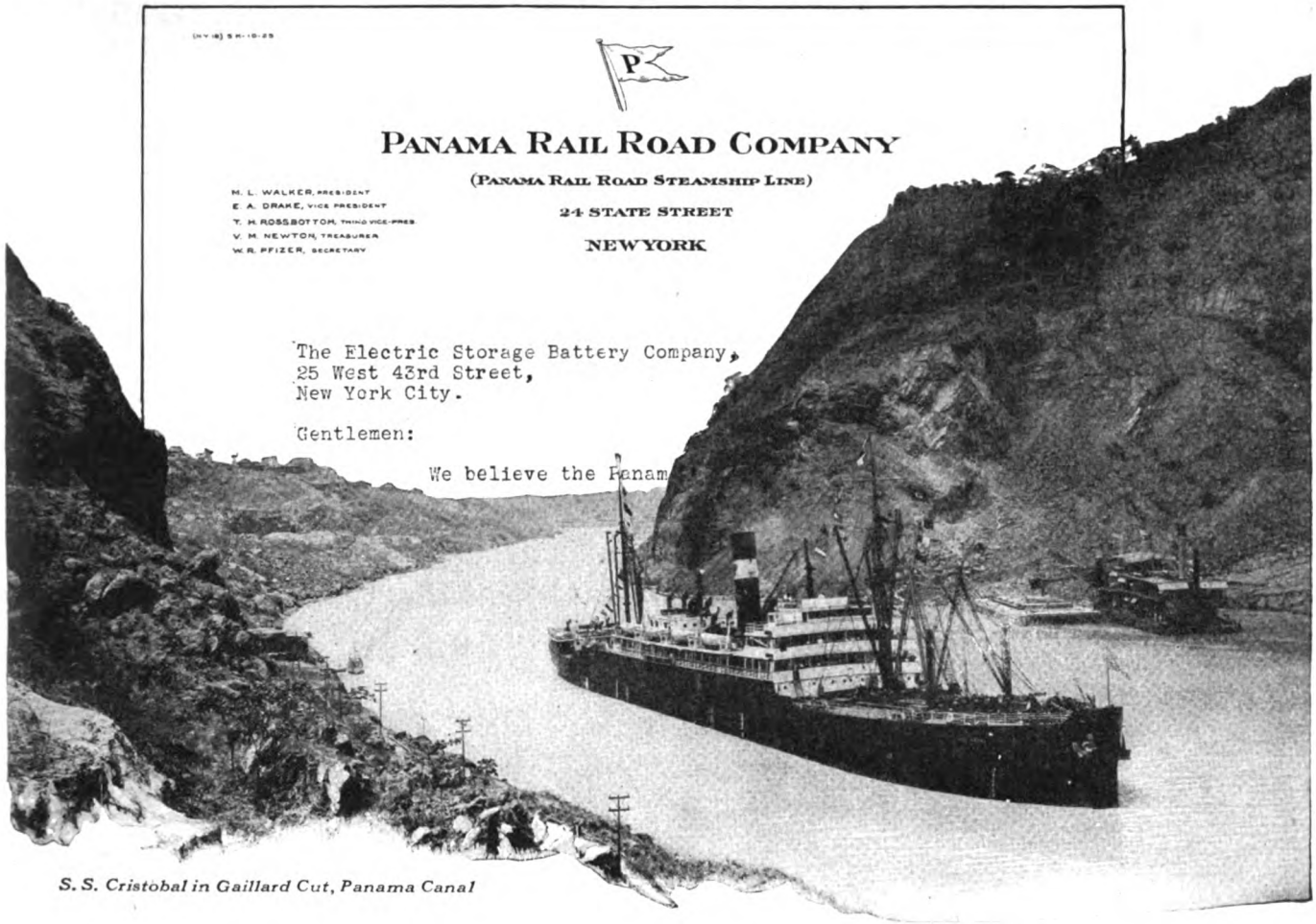

S. S. Cristobal in Gaillard Cut, Panama Canal

Ten years' dependable service is the rule and not the exception

That's what the Panama Line says about its Exide Marine Radio Batteries

SERVICE on the ships of the Panama Railroad Steamship Line is particularly hard on a marine radio battery because of the tremendous climatic changes to which it is subjected between New York and the Canal Zone. Yet here's what this company says about the service Exide Batteries have given:

"Our first installation of Exide Marine Radio Batteries, made in 1914, was purely voluntary and in accordance with the company's policy of adopting all due precautions to safeguard the lives and property on its ships.

"We have found Exide Marine Radio Batteries uniformly satisfactory, and our experience with the S. S. Ancon, which operated with the same 60-cell unit for ten years, from 1914 to 1924, is the rule and not the exception, as the S. S. Cristobal also operated for ten years with her original 60-cell unit. In view of those results, both vessels were again equipped with Exide Batteries when renewals became necessary. All our other steamers are similarly equipped."

There is an Exide branch at practically every important coast and inland port. We shall be glad to have a representative call and give you full information about marine battery installations if you will write us. You will be under no obligation.

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BATTERIES
FOR MARINE RADIO

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia

Exide Batteries of Canada, Limited, 153 Dufferin Street, Toronto

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Port Charges Too High

(*Continued from Page 20*)

draft when the vessel is drawing more than 10 feet. At Savannah the charge is from $15 for 6 foot draft up to $240 for 32 foot draft. At Charleston the charge varies from $14 for 6 foot draft up to $192 for 32 foot draft.

There are certain charges which are fixed by statute and will apply to all American ports, and others which are merely nominal and have little if any bearing upon the relative expenses of the port. A sample of the first are the tonnage dues which are fixed by statute and apply at all ports. These amount to 30 cents per net registered ton per annum for a ship making transoceanic voyages, such as the liners in the transatlantic trade which make probably from 6 to 12 calls a year at the port of New York. And there is a charge of 10 cents per net registered ton per annum on vessels making calls at New York and ports in the West Indies, or Canada, or the north shore of South America, runs which will allow probably 6 to 12 calls a year at New York. A sample of the nominal charges are the few dollars comprising the custom house and the surveyor's fees. These will hardly vary from port to port and even though they did, they would not have material effect upon the relative expense of the ports.

The agency fees might also be charged, which in some cases like that of Philadelphia will average probably not over $100 per ship. In another port it may be a charge of $5 for passing a line ,and in another some minor assessment for a particular anchorage. These minor charges, however, have little to do with the relative expense or economy of a port. What does control are the charges which are made for towage or assisting a ship into a berth, the charge for dockage and for lighterage of passengers and cargo, the charge for wharfage and rehandling, as well as for storage and demurrage. For the most part, these latter may be materially affected by the cost of stevedoring, which is a thing that varies materially as between ports.

On this page is reproduced the theoretical working account of the cost of entering a ship of 10,000 tons deadweight at Boston, New York and Philadelphia. These compilations were made by the bureau of research of the United States shipping board for this publication, and they show that the port charges at New York are about ten per cent more than at either of the other ports. This increase, it has been estimated in this compilation, is due exclusively to the fact that there is a charge appended at New York for watching the vessel. But it will be noted from this table that the shipping board has included wharfage and dockage as a charge against cargo rather than against the ship. This is merely a matter of opinion, for manifestly a vessel must have dockage if she is to make a port for she is rather impotent if she merely enters a port to drop anchor. And wharfage and dockage at New York for a vessel of 10,000 tons deadweight will cost at least a thousand dollars as against a charge of $687 at Philadelphia and no particular charge at Boston unless cargo is unloaded. Therefore, when wharfage and dockage is included in the port charges the cost at New York is likely to be nearly 50 per cent more than at either of the other ports.

When we figure that the strictly port charges against a vessel of this size may be approximately $500 or $1500 including wharfage and dockage it may with reason be pointed out that it is small in comparison with all the costs of operating the ships. But though the cost of fuel, of crew and of maintenance may cause these charges to shrink into a little of nothing in comparison, a ship must make savings on the small items if it is to effect economies in all costs. Should a vessel use New York or one of the other Atlantic ports but casually the port charges would probably not be a very serious matter, but it increases in importance when the ship is in regular trade between this and another port.

High Costs Repel Shipping

When the ship loads or unloads cargo at these Atlantic ports the problem becomes somewhat more complicated. As Capt. Robert Dollar recently pointed out, the stevedoring conditions at Boston are such that they make it difficult to do business there. The stevedores at Boston have had absolute control of the situation and have exercised the privilege of telling the shipowners what they can do and what they cannot do. They limit the weight that a sling load can contain and compel the shipowners to employ just about double the gang that is necessary. The conditions have been so intolerable in this regard that efforts are being made to bring about more equitable adjustments. The shipping board, therefore, has estimated that a 10,000 ton deadweight ship will spend over $7548 for checking and tallying and for stevedoring at Boston if the ship discharges approximately 5500 tons of general cargo there. This is more than it would cost at New York.

Remedies are sadly needed, not only at New York but at all Atlantic ports. And probably it would not be unwise to have a survey made of the port charges at all American ports. This should be done in justice not merely to the steamship owners but to that vast class of shippers and travelers who use ocean transportation, for in the last analysis they must pay for port extravagances.

COMPARATIVE STATEMENT OF THEORETICAL EXPENSES FOR PORT CHARGES AND CARGO HANDLING CHARGES OF A 10,000 DEADWEIGHT TON VESSEL—ENTERING AND DISCHARGING APPROXIMATELY 5500 TONS OF GENERAL CARGO AT THE PORTS OF BOSTON, NEW YORK AND PHILADELPHIA

PORT CHARGES	BOSTON	NEW YORK	PHILADELPHIA
Pilotage, in (on 24 feet)	$ 120.00	$ 117.12	$ 120.00
Tug hire, in	60.00	75.00	90.00
Tonnage tax	258.00	258.00	258.00
Customs fees	2.50	2.50	2.50
Customs brokerage	5.00	5.00	5.00
Watching vessel	.....	60.00	.....
Quarantine, health inspection	10.00	10.00	10.00
Miscellaneous	15.00	15.00	15.00
Total	**$ 470.50**	**$ 542.62**	**$ 500.50**
CARGO CHARGES			
Wharfage and dockage	$	$1,000.00	$ 687.00
Watching cargo	80.00	.....	80.00
Checking and tallying	1,100.00	.....	440.00
Stevedoring	6,187.50	*7,150.00	7,108.75
Miscellaneous	50.00	50.00	50.00
	$7,417.50	$8,200.00	$8,365.75
10 per cent to cover detentions and overtime of stevedores	618.75	715.00	710.85
Total	**$8,036.25**	**$8,915.00**	**$9,076.60**
SUMMARY			
Port charges	$ 470.50	$ 542.62	$ 500.50
Cargo charges	8,036.25	8,915.00	9,076.60
Total	**$8,506.75**	**$9,457.62**	**$9,577.10**

*Includes—Watching, checking and coopering.
Prepared by: Revenue and expense section—Operations 2/24/25.

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Can You Remember 'Way Back When . . .

A MERCHANT bought space in "the paper" because his friend Bill Smith was the publisher, and Bill said his paper was read by "nine out of every ten families in town"? Purely a friendly transaction with no thought of whether Bill's statement was open to question or his judgment in error.

Today the merchant wants to *know* what returns the publication will give as an advertising medium. Competition has forced him to buy space as he buys potatoes or sugar—not because the seller is a friend of his, but because he knows he will get the full quantity that is paid for, and that the expenditure will bring profitable results.

In other words, selecting mediums for advertising has passed from a haphazard procedure to an accurate scientific process. This has been brought about through A. B. C. reports.

The *Audit Bureau of Circulations* was organized eleven years ago to provide verified circulation data for the use of advertisers. It now has a large force of auditors who cover the United States and Canada once a year auditing the circulation reports of over 1400 publisher members.

A. B. C. reports containing full data on all circulation questions furnish the only means by which the advertiser can be positive that his advertising is reaching the prospective buyers he desires.

***MARINE REVIEW** is a member of the A. B. C. The latest report will be furnished on request.*

152 X

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Pier Maintenance Pays

(*Continued from Page* 33)

the amount of business handled. When the estimate is complete strike a monthly average and build up a maintenance fund by charging off each month the estimated amount. In place of varying maintenance expenditures due to large items such as dredging, painting, reroofing, and substructure repairs, the fund accumulated will take care of this class of work and preserve regularity in the balance sheet. Too many corporations allow maintenance to vary with earnings and grant authorities for expenditures during busy periods when repairs are hampered by operation. In some cases the work runs into overtime periods with attendant increase in cost.

Permanent Labor Force Is Desirable

If the property is of sufficient size the schedule will warrant the establishing of a fixed labor force especially if there is work to be performed on ships such as hull painting, washing down, cleaning holds, loading ship stores, and minor repairs. A fixed labor or shore gang will allow trained men to do this class of work and show a decrease in the cost. Periods between ship work may be used for maintenance. There is also the advantage of having trained men available when emergencies obtain and additional labor is required. The regular labor gang may be drawn on for gang leaders or even foremen so that competent supervision is assured and the work progresses normally. Where skilled labor is required the same scheme may be carried out but the fixed gang must be kept small since skilled labor wages quickly increase the payroll and there is a tendency to find work for the men to tide the gang over slack periods.

Authority will as a rule be granted without question for a contract job by competitive bidding, but a payroll increase will take more explaining than the fourth dimension. Contract work requires supervision at all times especially on substructure repairs. It is a hard matter to write specifications that adequately cover this class of work. Repairs may be contemplated on a fender system and when the work is opened up it will be found that the side caps and rangers are in need of attention. Additional specifications are necessary if the contract is to be made or else the contractor is allowed to perform the work on cost plus basis. Competent inspection is then needed and a man from the skilled labor gang is more to be desired than an outsider.

Test Materials to Be Used

Materials used on waterfront structures should be selected for their durability. Moisture, salt air, and electrolysis are continually at work and inferior grades of paint, lumber and metal only serve to increase labor and material costs. Co-operation of the purchasing agent is necessary if proper materials are to be obtained. He is buying on a first cost basis and you are working on a period basis. He cannot object to buying based on actual test, and testing performed under service conditions is the best indicator of the fitness of any material. Elaborate testing equipment, laboratory analysis and composition specifications are not required except for special work. Modern chemistry has so revolutionized the manufacturing industries that the chemical analysis of a commodity used in pier maintenance means little or nothing to the user.

Durability of Paint Determined

Take the item of paint and follow through a practical test. Have your purchasing agent obtain samples of paint from several different manufacturers and with each sample paint two strips of metal and two strips of wood about four inches wide and five feet long. Place one metal and one wood panel of each sample on the roof of your structure where it will be exposed to wind, rain, and sun. Place the other panels under the pier where they will be covered at high tide and bare at low tide. At the expiration of 30, 60 and 90 days look them over and you will have no difficulty in selecting the paint for your particular use.

This test on one pier resulted in

UPPER DECK OF PIER 86, NORTH RIVER NEW YORK. ONE OF THE NEW MODERN PIERS—A CREDIT TO THE BUILDERS AND TO THE CITY—FULLY EQUIPPED, SPACIOUS, CLEAN AND ORDERLY THIS PIER IS MAINTAINED IN FIRST CLASS CONDITION IN EVERY PARTICULAR—NO DETAIL IS OVERLOOKED TO INCREASE ITS EFFICIENCY AND EFFECTIVENESS

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A great part of the routine work aboard ship is handled by rope. For this work, both economy and safety demand the greatest degree of strength and durability that the rope market has to offer. This need for really good rope and the steadfast service which Plymouth Rope has rendered to ships since 1824 have combined to make the Plymouth organization the largest as well as the oldest American rope-making institution.

Plymouth Rope is the result of an unequaled supply of raw materials, intelligently handled and worked by experts on specially developed modern machines. It is made under a fixed policy of first-quality goods only, with manufacturing standards, equipment and power without equal in the rope industry.

Ship Chandlers everywhere handle Plymouth Cordage

PLYMOUTH CORDAGE CO.

North Plymouth, Mass. ***Welland, Canada***

PLYMOUTH *The Rope You Can Trust**

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a saving of 16 per cent per annum on general outside painting while the cost of making the test was less than ten dollars. Before the tested paint was applied, the structure had been painted every two years with a paint made to specifications. The specifications were 30 years old, and the paint cost $2.54 per gallon. The tested paint which was applied three years ago cost $2.10 per gallon and is still in very good condition. An adjoining structure was painted with a paint purchased on price alone at $1.86 per gallon and after eight months is now ready for repainting. What is true of paint is true of the majority of materials entering into maintenance work and the economic quality is best found by test and usage under service conditions.

Maintenance being influenced by local conditions affecting both labor and materials it is necessary to confine articles of this nature to generalities but they may be adapted to meet the needs of the reader in solving his own special problems. However irrespective of location the horse should be fed on Sunday.

Shipbuilding in American Yards-March 1, 1926

ON March 1, 1926, American ship yards were building or under contract to build for private shipowners 227 steel vessels of 235,464 gross tons compared with 233 steel vessels of 253,385 gross tons on Feb. 1, 1926, according to the bureau of navigation, department of commerce.

There were 46 wood vessels of 15,823 gross tons building or under contract to build for private shipowners during the same period compared with 45 wood vessels of 14,998 gross tons on Feb. 1, 1926.

To the right is a summary of reports of shipyards to the bureau of navigation, department of commerce, showing the number and gross tonnage of steel and wood vessels of 100 gross tons and over, under construction or contract for private shipowners on March 1, 1926.

Companies	Steel No.	Steel Gross	Wood No.	Wood Gross
Alabama Dry Dock & Shipbuilding Co., Mobile, Ala	1	650	....	.....
American Bridge Co., Pittsburgh	80	36,040	....	.....
American Car & Foundry Co., Wilmington, Del	....	.....	20	7,400
American Shipbuilding Co., Cleveland	1	8,500	....	.....
Bethlehem Shipbuilding Corp.:				
Union Plant, Bethlehem, Pa.	5	3,990	....	.....
Harlan Plant, Wilmington, Del.	3	2,296	....	.....
Sparrows Point Plant, Sparrows Point, Md	2	950	1	500
Union Plant, San Francisco	2	1,113	....	.....
Brown, Boveri, Electric Corp., Camden, N. J.	6	7,425	....	.....
Bushey & Sons, Ira S., Brooklyn, N. Y.	....	.....	3	675
Craig Shipbuilding Co., Long Beach, Calif	2	1,690	....	.....
Cramp & Sons Ship & Engine Bldg. Co., Philadelphia	9	26,594	....	.....
Dravo Contracting Co., Pittsburgh	38	15,400	....	.....
Federal Shipbuilding Co., Newark, N. J.	5	22,000	....	.....
General Engineering & Dry Dock Co., Alameda, Calif	....	.....	1	650
Great Lakes Engineering Works, River Rouge, Mich	3	9,230	....	.....
Hanlon Dry Dock & Shipbuilding Co., Oakland, Calif	1	250	....	.....
Howard Shipyard Co., Jeffersonville, Ind	7	3,101	....	.....
Jakobsen & Petersen, Brooklyn, N. Y.	....	.....	3	600
James, John F., Essex, Mass	....	.....	2	200
Kingston Dry Dock & Construction Co., Kingston, N. Y.	....	.....	1	250
Lawley & Son Corp., Geo., Neponset, Mass	1	365	1	170
Lenahan Co., R., Kingston, N. Y.	....	.....	8	3,526
Los Angeles Shipbuilding & Dry Dock Corp., San Pedro, Calif.	3	712	....	.....
Manitowoc Shipbuilding Corp., Manitowoc, Wis.	4	3,500	....	.....
Marietta Manufacturing Co., Point Pleasant, W. Va	5	1,575	....	.....
Midland Barge Co., Midland, Pa.	2	288	....	.....
Moore Dry Dock Co., Oakland, Calif.	2	3,000	....	.....
Nashville Bridge Co., Nashville, Tenn.	1	142	....	.....
Newport News Shipbuilding & Drydock Co., Newport News, Va.	23	72,860	....	.....
Pusey & Jones Co., Wilmington, Del.	2	1,440	....	.....
Rhode Sons Co., Chas. L., Baltimore, Md.	....	.....	6	1,852
Spedden Shipbuilding Co., Baltimore	1	260	....	.....
Staten Island Shipbuilding Co., Staten Island, N. Y.	4	3,020	....	.....
Sun Shipbuilding & Dry Dock Co., Chester, Pa.	6	5,575	....	.....
Todd D. D. & Engineering & Repair Corp., Brooklyn, N. Y.	1	498	....	.....
Ward Engineering Works, Chas., Charleston, W. Va	7	3,000	....	.....
Total	227	235,464	46	15,823

Double Acting Diesel Performs Well

BY O. A. KENYON

THE 30-day run, and the maneuvering tests that followed, of the new four-cylinder, two-cycle, double-acting diesel engine, built for the United States shipping board were concluded at the Snow-Holly works of the Worthington Pump & Machinery Corp. on March 7. An article in MARINE REVIEW for April gives a general description of the engine and an account of the test, but without detailed figures of the results.

In this test there are several remarkable performance features but the most significant perhaps was the fuel record. From the beginning to the end this engine was operated on ordinary navy bunker oil such as is burned normally under boilers. Some of this oil ran as low as 14 degrees Baume. The average gravity at 60 degrees Fahr. was 20.19. Viscosity, Saybolt-Furol at 77 degrees Fahr. was 64.

In spite of the character of the fuel oil, the working parts of the engine were in excellent condition. The liners were smooth and covered with a continuous oil film, and after they were cleaned the surface was polished and free from score or burnishing. The piston rings were all free and everything was perfectly tight. Following is the official log of the entire test.

Date of test	Feb. 2 to March 4, 1926
Location	Buffalo, N. Y.
Builder	Worthington Pump & Machinery Corp.
Test conducted by	United States Shipping Board
Bore in inches	28
Stroke in inches	40
Number of cylinders	4
Duration of test, hours	720
Revolutions per minute, average	96.4
Total revolutions	4,164,952
Brake horsepower, average	2907
Indicated horsepower, top of cylinder	558
Mean indicated pressure pounds per square inch	93.2
Indicated horsepower, bottom of cylinders	448
Mean indicated pressure, pounds per square inch	83.7
Indicated horsepower, total	4035
Mean indicated pressure, average	88.5
Mechanical efficiency, per cent	72.7
Air compressor indicated horsepower	187.8
Scavenging pump indicated horsepower	194
Fuel, tons per 24 hour day	15.14
Fuel, per hour, pounds	1413
Fuel per indicated horsepower hour, pounds	0.332
Fuel per brake horsepower hour, pounds	0.462
Thermal efficiency, brake, per cent	29.6

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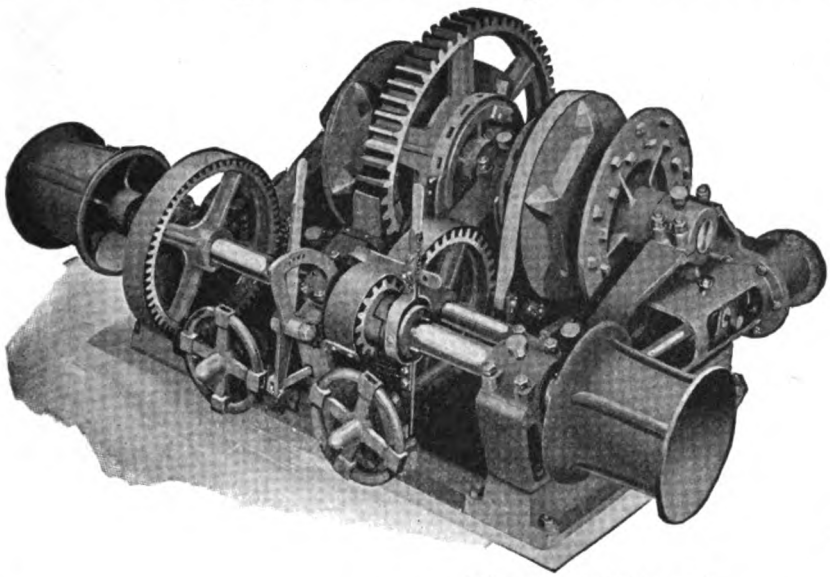
The "Superior" Spur Geared Windlass



WE ALSO BUILD

Windlasses
Steering Gears
Capstans
Gypseys
Winches
Hoisting Engines
Swinging Engines
Power Pawl Posts
Dredge Deck Engines
Anchor Hoists
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Manufacturers of

Steam and Electrical Machinery

SUPERIOR IRON WORKS COMPANY

SUPERIOR, WISCONSIN

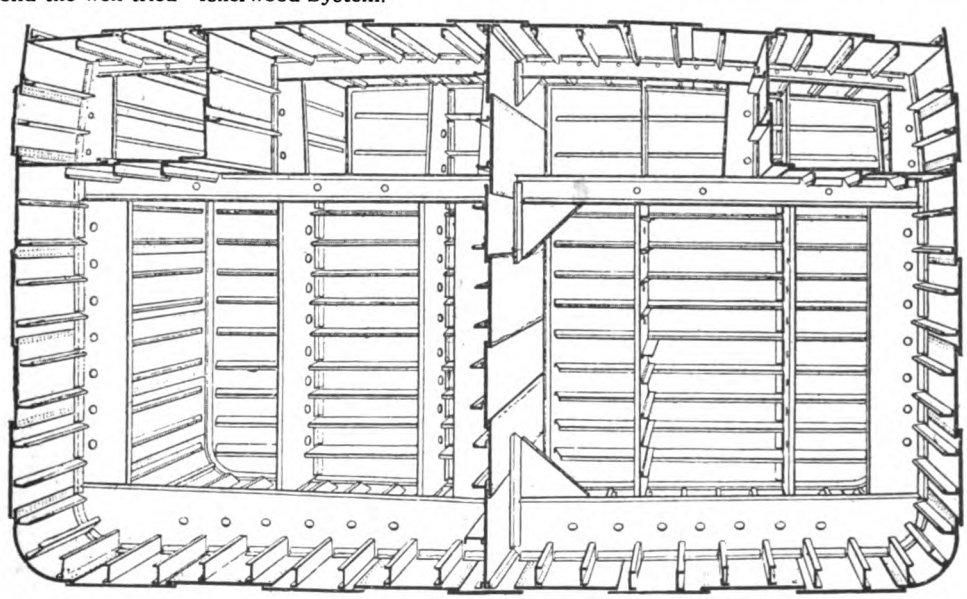
Progress in Oil-Tank Ship Construction

THE

"BRACKETLESS—SYSTEM"

(PATENTED)

Eliminates Bulkhead Brackets. Eliminates Bulkhead Leakage. Greatly simplifies construction. Greatly reduces cost of upkeep and cost of damage repairs. Greatly reduces cost of cleaning tanks. Substantially increases the longitudinal strength beyond the well-tried "Isherwood System."



For Particulars Apply

Sir Joseph W. Isherwood, Bt.

17 Battery Place, New York and
4, Lloyd's Avenue, London, E.C. 3

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Lubricating oil, gallons per 24 hours
- Power cylinders 2.79
- Stuffing boxes 4.25
- Air compressor 0.46
- Scavenging pump 0.17
- Hand feeds 0.26
- Crank case 7.07

Total, gallons per day 15.00

Cooling water, gallons per brake horsepower hours, pounds 5.5

Temperatures
- Cooling water degrees Fahr. to compressor 35 from compressor 40
- Cooling water, degrees Fahr. to engine jackets 40 from jackets 120
- Cooling water, degrees Fahr. to pistons 40 from pistons 105

Exhaust temperature, degrees Fahr. 532

Lubricating oil, degrees Fahr. to engine 95 from engine 96

Fuel oil, degrees Fahr. 89

Engine room, degrees Fahr. 68

Outside air, degrees Fahr. 29

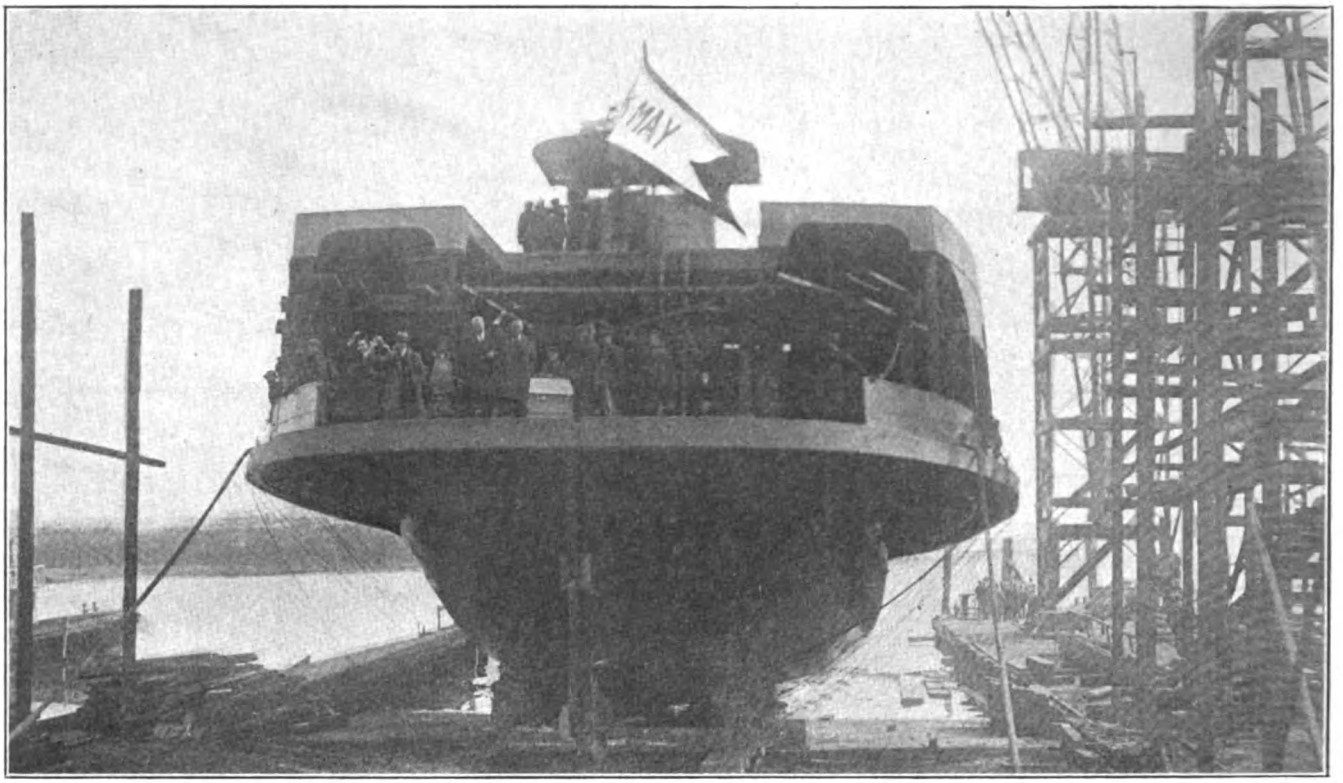
Compressor Air Temperatures
- 1 stage, degrees Fahr. to cooler 142 from cooler 43
- 2 stage, degrees Fahr. to cooler 139 from cooler 43
- 3 stage, degrees Fahr. to cooler 138 from cooler 42
- 4 stage, degrees Fahr. to cooler 234 from cooler 77

Pressures
- Injection air, pounds per square inch 890
- Standby air receiver, pounds per square inch 869
- 3 stage of compressor, pounds per square inch 246
- 2 stage of compressor, pounds per square inch 74
- 1 stage of compressor, pounds per square inch 24
- Scavenging air, pounds per square inch 1 11/16
- Lubricating oil, pounds per square inch 12
- Cooling water, pounds per square inch 30
- Barometer, inches 29.09

The fuel used had average characteristics as follows, although some samples received were as low as 14 degrees Baume.
- Gravity, Baume at 60 degrees Fahr. 20.19
- Flash point, degrees Fahr. 177
- Burning point, degrees Fahr. 270
- Viscosity, Saybolt Furol at 77 degrees Fahr. 64
- Hydrogen, per cent 13.02
- Oxygen, per cent 0.37
- Carbon, per cent 85.29
- Water, per cent 0.11
- Asphalt, per cent 5.95
- Sulphur, per cent 0.37
- Ash, per cent 0.08
- Heat value, B.t.u. per pound high value 18,733

Heat value, B.t.u. per pound low value 17,680

New Ferryboat Is Launched



Ferryboat CAPE MAY for the Philadelphia & Reading Railroad, launched at the Harlan Plant, Bethlehem Shipbuilding Corp., Wilmington, Del., March 18, 1926

THE latest addition to the Philadelphia & Reading railroad's fleet of ferries is the CAPE MAY, launched at the yards of the Bethlehem Shipbuilding Corp. Ltd., Harlan plant at Wilmington, Del, on March 18, 1926.

The principal dimensions of the CAPE MAY are as follows:

	ft.	in.
Length between stems	198	0
Length over guards	200	0
Beam molded at deck	35	0
Breadth over guards	55	6
Depth, molded hull	16	0
Maximum draft	10	0

The vessel is designed to handle the Reading's passenger, automobile and truck service between Chestnut street wharf, Philadelphia, and the company's terminal in Camden, N. J., and is of the usual double end type driven by double compound reciprocating engines coupled to straight through shafting with propeller wheel at each end. There is a drive way on the main deck through the center of the vessel from end to end, divided amidships by a narrow machinery casing, thus permitting the maximum of space for automobiles and trucks. Outboard of the drive way and to either side, on the main deck, are located the passenger cabins. The upper deck contains only the pilot houses, one at each end, and provision for boat stowage, but no passenger accommodations.

The hull is of steel, and is divided into six water tight compartments, by five water tight steel bulkheads, extending from keel to main deck. Hull stiffening is provided by two intercostal keelsons on each side, bracketed to each water tight bulkhead. Starboard and port keelsons are connected at ends of the vessel to form breast hooks. The structure will be further stiffened by two longitudinal trusses, one port and one starboard, extending from collision bulkhead to collision bulkhead, and connected at bottom to shell and at top to main deck with channel bar stanchions at regular intervals, thus providing a structure of exceptional strength which will be required to

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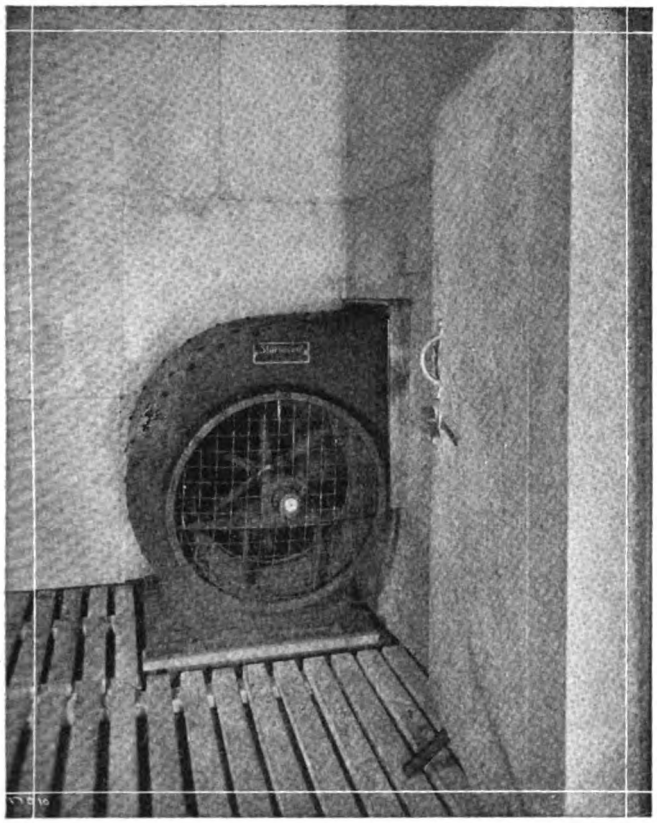

Sturtevant Multivane Fan used with refrigerating plant on S. S. Ancon

Sturtevant Fans on S.S. Ancon

That Sturtevant Equipment gives complete satisfaction under all conditions is evidenced by its splendid performance on hundreds of passenger and commercial boats.

In reconditioning the Panama Line Steamer Ancon, three Sturtevant Multivane Fans were selected. Two of these fans are used for ventilation and the third one is working in conjunction with the refrigerating plant and supplies air to the brine coils.

Sturtevant Products for ships include Mechanical Draft Apparatus, Turbines, Motors, Blowers, Ventilating Sets, Heaters, Generating Sets, Exhausters, Gasoline and Steam Engines.

Marine architects and engineers, ship builders and ship repairers should not hesitate to call on our Marine Department for advice and recommendations of equipment suitable for their ships.

B. F. STURTEVANT COMPANY

Plants located in

Hyde Park, Mass. Framingham, Mass. Sturtevant, Wis.
Camden, N. J. Berkeley, Cal. Galt, Ontario

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Sturtevant PUTS AIR TO WORK

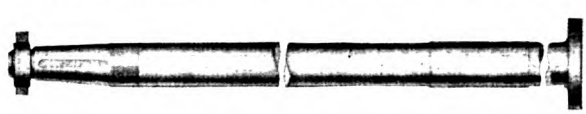
UNDER ALL FLAGS The McNab

McNab Direction Indicator

When entering or leaving port, or negotiating narrow and congested waterways, the McNab Direction Indicator is a necessity. It gives to the Navigating Officers knowledge of the actual engine movement ahead — astern — speed and revolutions.

McNab Indicators are installed on every well known vessel throughout the world. Only the highest quality materials used in manufacture. The McNab is the recognized standard.

McNab "Vista" System of Tail Shaft Lubrication



Approved by Lloyds and other classification societies and adopted by the principal Governments and shipowners throughout the world. *Advantages:* Sand kept out of stern tube; corrosion and rust prevented; *increase in revolutions;* vibration reduced and, if desired, elimination of expensive bronze liners. Thousands of endorsements.

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YONKERS, N.Y.

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meet the heavy traffic encountered in the Reading company's service.

The main deck will be of steel plate planked with Oregon pine. The center house or machinery casing, is of steel and extends from the main deck to above the upper deck. The side houses or cabins, are built entirely of steel and are arranged for the accommodation of passengers. All interior finish in these spaces is of fire proof paneling. The outboard bulkheads are provided with windows with transoms over, according to the Reading company's standard practice. Windows without transoms are arranged to lift and are fitted with spring balances. The upper deck is of steel and supports two steel pilot houses, one at each end, and also has provision for stowage of life boats, and other life saving gear.

There are two rudders, slightly balanced, one at each end. The rudders have cast steel frames with steel plates riveted to frames, and are provided with separate stocks. The rudder quadrants are built up of steel plate and angle riveted to forged steel arms and hubs. The center arms of the quadrants are provided with sockets for centering pin.

The steering gear consists of two 6 x 6-inch steam steering engines, one for each rudder. One engine is located in a compartment aft of engine room, and one in a compartment forward of boiler room. A steering wheel mounted on a brass column in each pilot house is connected to the control valves of the steering engines by means of shafting and gears. An auxiliary hand steering gear is provided and connected ready for immediate use in the event that the steam gear should fail.

Description of Machinery

There are provided two cylindrical "straight through" type boilers 10 feet 6 inches in diameter by 20 feet 9 inches long, each with two Morrison suspension type furnaces. The boilers are designed to furnish steam at 160 pounds per square inch working pressure.

The propelling machinery consists of two vertical inverted, direct acting two cylinder compound engines, 17 x 34 inches x 24-inch stroke, arranged one forward of the other, coupled together, making four cranks and four cylinders, namely, two high and two low pressure working on one continuous shaft extending from end to end of boat with propeller at each end, designed to develop sufficient power to drive the vessel at a speed of 14 statute miles per hour.

There are two four-bladed, cast steel propellers, 8 feet 6 inches diameter, the thrust being taken by two horse-shoe type thrust bearings, one bearing forward of the engines and one bearing aft. The auxiliary machinery and apparatus consists of the following:

One main surface condenser having cast iron heads and shell, brass tubes and rolled bronze tube plates.

One vertical twin beam airpump.

One centrifugal circulating pump with cast iron shell and bronze impeller, direct connected to a vertical 7 x 6-inch steam engine.

One multicoil revolving type feed water heater of sufficient capacity to supply boiler feed water at 210 degrees Fahr.

One main feed pump, vertical simplex, having 9-inch and 6 inch cylinders by 12-inch stroke.

One fire and donkey pump—horizontal duplex, having 12-inch and 8½-inch cylinders by 12-inch stroke and fitted to serve as auxiliary feed pump.

MRS. WILLIAM SHEPPARD
Wife of the Mayor of Cape May, N. J. and Sponsor of the New Ferryboat

One 2-inch injector—double tube compound.

There are provided two 10 kilowatt, 110 volt direct current generating sets to furnish current for the navigating circuits and ships lighting throughout.

The vessel will be heated by steam, and every provision has been made for the safety and comfort of passengers. The construction is as nearly fire proof as can be made, and the fire fighting and life saving facilities are the last word in every respect.

The CAPE MAY will be completed early in May of this year, and after the usual dock and river trials, will be delivered to the Reading company, at their terminal in Camden, N. J., for service on the Delaware river between Philadelphia and Camden.

French Liner Launched

(*Continued from Page* 13)

gency unit but will be used in connection with the apparatus of the principal station and will have the same range. The other will receive its energy from a group of accumulators and its range will be 150 miles by daylight and 250 miles at night. In addition, there will be one transmitting set of one kilowatt-ton, one set combining transmission and reception, a series of amplifiers for transmitting concerts to all parts of the vessel, one radiotelephone station which will enable conversations to be carried on with land stations and ships fitted with similar installations. Such installations already exist on the PARIS and the FRANCE of the Compagnie Generale Transatlantique.

The ship will be fitted with one Sperry gyroscopic compass, one automatic pilot driving the ship in connection with the Sperry compass, one radiogoniometer coupled with the repeaters of the gyroscopic compass which will be the means of taking radiophonic bearings at a distance of about 200 miles with an approximation of less than two degrees. This will permit of landings in the English Channel or Nantucket in the fog. There also will be one sound finding apparatus operating on the echo principle.

Boilers and Main Turbines

The boiler rooms will contain 12 cylindrical boilers with double fronts and eight furnaces to each, and eight boilers with single fronts and four furnaces to each. These boilers will operate with Howden forced draft and will be fitted in four water-tight compartments. There will be three funnels. The fuel used will be oil. The storage tanks will contain 7500 tons of fuel oil which will be sufficient for a complete return journey Havre—New York.

The turbines will be of the Parsons type and will operate four screws. The total power will be 52.000 shaft horsepower giving the vessel an average speed of 23 knots. Four turbines in triple cascade will be used for going forward, and four turbines in double cascade for going backward. The total weight of the turbines will be 1060 tons.

Passenger accomodations will be arranged to provide the utmost in comfort and elegance. The ILE DE FRANCE will embody a style of interior decorations and a sumptuous luxury hitherto unknown in the world of steamships, and which will mark a new era in ocean travel.

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MARINE DEPARTMENT

of

American Bridge Company

FRICK BUILDING PITTSBURGH, PENNA.

BUILDERS OF

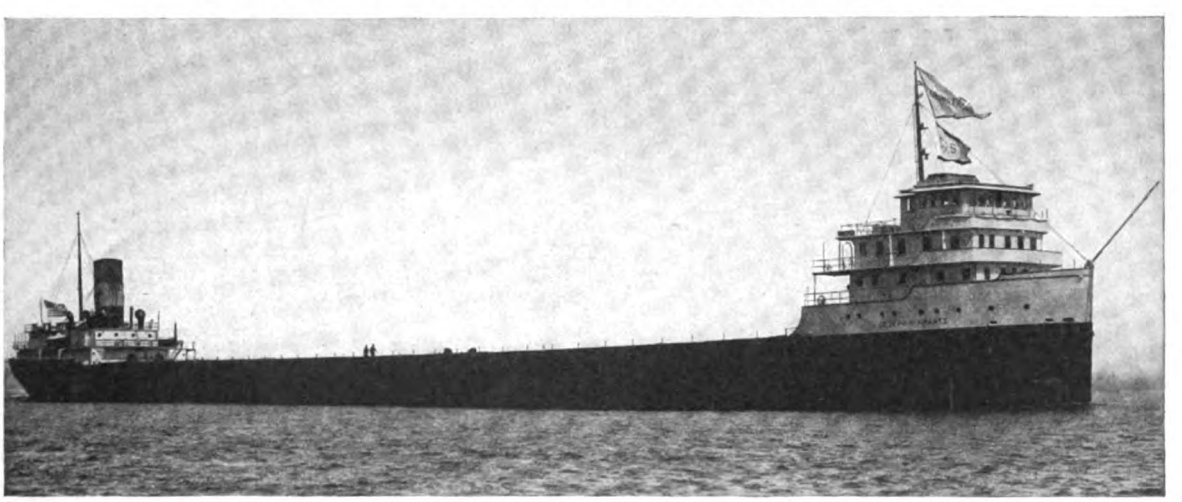
STEEL BARGES

for RIVERS and HARBORS

CAR-FLOATS

THE BABCOCK & WILCOX CO.

Manufacturers of Marine Water Tube Boilers Since 1895



Steamer "JOSEPH H. FRANTZ", The Columbia Steamship Company

Equipped with
Babcock & Wilcox Water Tube Boilers and Superheaters

THE BABCOCK & WILCOX CO.
Marine Department
85 LIBERTY STREET, NEW YORK

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Lake Carriers Meet

(*Continued from Page* 35)

Mr. Baker pointed out that there were two separate suits now pending before the Supreme Court of the United States. One of these suits is sponsored by the state of Wisconsin and is supported by a number of other Great Lakes states, the other is sponsored by the state of Michigan and is also supported by other Great Lakes states. The essential difference between the Wisconsin suit and the Michigan suit is that in the former the Supreme Court of the United States is requested to rule that the congress of the United States has no authority to permit the diversion of lake water, but that if the Supreme Court rules that congress has a right to divert water for navigation purposes, that the court will set a maximum figure not to exceed a thousand cubic feet per second for such purposes. The Michigan suit is similar to the Wisconsin suit except that it does not concede that congress has any right whatsoever to allow the diversion of any water for any purposes from one watershed to another. Mr. Baker stated that in his opinion these suits will both be tried together and they will come up in the Supreme Court probably not before December of this year.

In the meantime, he pointed out, that it was most important for all of the people of all of the states on the Great Lakes opposed to this diversion to continue with all their might and main to fight every attempt of the sanitary district to continue diversion at will. As a practical definite step, it was suggested by Mr. Ashley, that every member of the Lake Carriers telegraph to that congressman whom he might know on the steering committee in congress and on the rivers and harbors committee, or to Speaker Longworth protesting particularly against the inclusion in the rivers and harbors bill of that proviso which has to do with the Illinois river project, which is merely an attempt to get the authority of congress for the diversion of water for the Illinois river from Lake Michigan, with the hope that if it is tacked on to the general rivers and harbors bill it will go through.

Mr. Baker pointed out that this project should stand on its own feet and that pending the decision of the Supreme Court of the United States, congress should stay its hand in a matter of authorizing the diversion of any water.

Recent Sales of Ships

T. V. O'Connor, chairman of the United States shipping board, has announced the following sales of government tonnage:

FLOATING DRYDOCKS, three, ten thousand ton floating drydocks, located at (1) Robins Shipyard, Brooklyn, N. Y., (2) Alderton Dry Dock Co., Ltd., Staten Island, N. Y., (3) At the plant of the Sun Shipbuilding & Dry Dock Co., Chester, Pa., have been sold to the Todd Shipbuilding Corp. for $420,000 in cash.

CRATHORNE, lake type cargo, 3364 deadweight tons, for $25,000 subject to certain preliminary conditions, to Frank J. Peterson of Cleveland. This vessel at the present time is laid up in the James river and will undergo certain repairs.

WEST CAHOKIA, a steel two deck ocean cargo vessel, 8584 deadweight tons for the sum of $197,000 subject to certain preliminary conditions to the Ocean Transport Co. Inc., New York. This vessel is equipped with a triple expansion engine of 2600 indicated horsepower and three Scotch boilers and is designed to steam about 10¾ knots on 34 tons of oil a day. At the present time she is undergoing repairs at San Francisco.

MORAVIA BRIDGE, steel ocean cargo vessel of Submarine Boat Corp. type, 5340 deadweight tons built in March, 1920, to the Matson Navigation Co. for the sum of $31,030 cash, subject to certain preliminary conditions. This vessel is equipped with Westinghouse geared turbine of 1440 shaft horsepower and Babcock & Wilcox water tube boilers. Her rated speed is 10 knots on 20 tons of oil a day. The vessel at the time the sale was made was laid up at Hog Island.

WEST MONTOP, steel, two deck ocean cargo vessel of 8303 deadweight tons built by the Los Angeles Shipbuilding Co. in December, 1919, to the California & Eastern Steamship Co. of Los Angeles for the sum of $175,000 subject to certain preliminary conditions. This vessel is equipped with triple expansion engines of 2470 indicated horsepower and three Foster water tube boilers and is designed to steam about 10½ knots, on 32 tons of oil a day. At the time the sale was made she was laid up at San Francisco.

EAST CHICAGO to Swayne & Hoyt, Inc., of San Francisco, for the sum of $36,000, subject to certain preliminary conditions. The EAST CHICAGO is a Submarine Boat Corp type vessel of 5340 deadweight tons, designed for a speed of approximately 10½ knots on 20.7 tons of oil per day, and at the present time is laid up in the James river.

WEST HEPBURN and the WEST WIND, two-deck steel cargo vessels, 8564 and 8800 deadweight tons, respectively, built by J. F. Duthie & Co., in August 1919, and the Northwestern Steel Co., in February 1918, respectively, were awarded to Sudden & Christensen of San Francisco, for the sums of $175,000 and $162,000, respectively. Each vessel is equipped with a triple expansion engine of 2520 indicated horsepower and three Scotch boilers, and is designed to steam 10¼ knots on about 33 tons of oil a day. The WEST HEPBURN, designed as an oil burner, is presently outfitted to burn coal. The WEST WIND at the present time is laid up in New York and the WEST HEPBURN is laid up in Philadelphia. Both will undergo certain repairs.

CONTINENTAL BRIDGE, HOLYOKE BRIDGE and BOUND BROOK, 5289, 5340 and 5196 deadweight tons respectively, built between July 1919 and May 1920, by the Submarine Boat Corp., were awarded to Swayne & Hoyt, Inc., of San Francisco, for the sums of $34,000, $32,000 and $32 000, respectively. These vessels are equipped with Westinghouse turbines of 1440 shaft horsepower and Falk gears, and are designed to steam about 10 knots on 20 tons of oil a day. At the present time these ships are laid up in the James river and will undergo certain repairs.

STORM KING, two-deck steel cargo vessel of 8434 deadweight tons, built by the Newburgh Shipyards in December, 1920, was awarded to the Export Steamship Corp., of New York for the sum of $63,255. She is equipped with a triple expansion engine of 2440 indicated horsepower and three Scotch boilers, and is designed to steam about 10 knots on 32 tons of oil a day. At the present time she is in the port at New York.

PRESIDENT GRANT, PRESIDENT JACKSON, PRESIDENT JEFFERSON, PRESIDENT MCKINLEY and PRESIDENT MADISON were sold by the shipping board to the American Oriental Mail line, for $900,000 each, with guarantee to maintain adequate service between Puget Sound and the Orient. The sale was made in pursuance of the shipping board policy in the upbuilding of an American merchant marine to transfer shipping as rapidly as possible to private ownership, thus saving the government a great annual loss. By private ownership alone, a permanent American merchant marine can best be secured. The bid accepted was higher by $100,000 per ship or a total of $500,000 than any others, and the ships were therefore sold to the Admiral Oriental Line. The vote was four to one, Commissioner Benson voting against the sale.

World Markets

BARON CAWDOR, double deck steamship, 8900 deadweight tons, 5864 gross tons, for about £50,000 to Deutsche Dampfs. Ges. "Hansa," Bremen.

LLANBERIS, single deck steamship, 6133 deadweight tons, 4050 gross tons, for about £9500 to British buyers.

LOWLANDS, single deck, 5800 deadweight tons, 3559 gross tons, for about £5000, to British buyers.

LUISE NIELSEN, double deck steamship, 8750 deadweight tons, 5759 gross tons, for about £28,000, to Japanese buyers.

GUISEPPE SONCINO, single deck steamship, 5160 gross tons, for about £17,000 to Japanese buyers.

HELMO HEMSOTH (renamed GERTRUDE SCHUNEMANN), single deck steamship, 1630 deadweight tons, 1095 gross tons, for about £12,000 to Haubuss Shipping Co., Stettin.

JAPAN, double deck steamship, 8640 deadweight tons, 6052 gross tons, for about £15,250 to Japanese buyers.

ORTHRYS, double deck steamship, 8200 deadweight tons, 5106 gross tons, for about £46,000 to Japanese buyers.

Canada Steamship Lines Order Two Vessels

The Canada Steamship Lines, Ltd., Montreal, has kindly furnished the MARINE REVIEW with particulars of the two new package freight steamers which were recently ordered and are now under construction at the works of the Davie shipbuilding & Repairing Co., Ltd., Lauzon, Levis, Que. The contract calls for delivery of both vessels on or about Sept. 1, 1926.

These vessels are of steel, single screw, two-deck steamers. The molded dimensions are 250 feet in length, 42 feet 9 inches in breadth and 26 feet 6 inches in depth. The lower hold is 14 feet 6 inches deep and 'tween deck is 9 feet. There is a double bottom, three holds, and five bulkheads (three of them of water-tight construction). In the spar or top deck are six cargo hatches and there are seven hatches through the main or 'tween deck. The 'tween deck is also served by three cargo gangway doors on both port and starboard sides. The four derricks on the spar deck have a capacity of five tons each and are served by four double-geared cargo winches. There is a cargo line shafting in 'tween decks on the starboard side with double drums at six

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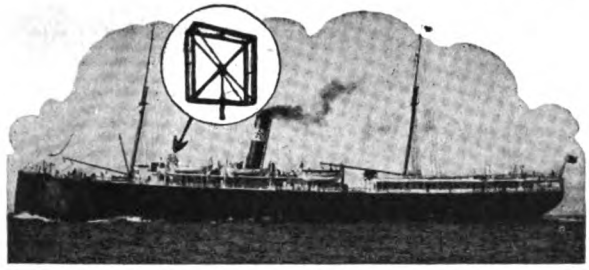

SS. Rose City of the McCormick Steamship Company has the protection of the Kolster Radio Compass

Dead Ahead !

Saved by the Kolster Radio Compass

A dense fog—other vessels in the vicinity—and yet safe! That's the advantage of the Kolster Radio Compass.

Radio bearings are taken—courses are altered—ships pass in safety. There are many such instances of record that point to the Kolster Radio Compass as the greatest aid to navigation.

How soon will your vessels have this protection?

Bulletin 25 will interest you

SPEED-EFFICIENCY-RELIABILITY
FEDERAL
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FLEXIBLE — WET or DRY

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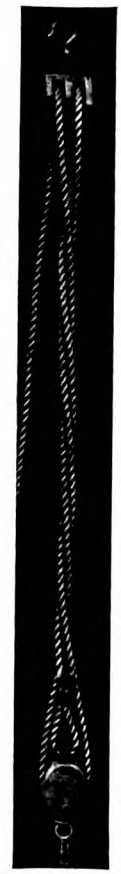

Ordinary Rope Wet

Whitlock **WATERFLEX** Manila is **water-resisting;** the fibre remains permanently lubricated.

WATERFLEX rope is practically unaffected by dampness, rain or continued immersion in water.

Annoyances caused by swelling, hardening and kinking are eliminated.

WATERFLEX rope, when wet, **remains flexible** and continues to handle easily and to run readily through blocks and over sheaves. Even a new hawser of large size can be spliced and handled with ease, wet or dry.

WATERFLEX rope **lasts longer,** as the rotting of fibre is eliminated.

Our claims of absolute superiority for **WATERFLEX** rope have been thoroughly proven in the most severe kinds of marine and other service.

Waterflex Wet

FIBORE (our patented fibre-core rope) made the **WATERFLEX** way, is the last word in cordage of large size.

Write for descriptive Folder.

WHITLOCK CORDAGE COMPANY
46 South Street. New York

Factory and Warehouses Jersey City, N. J.

Branches Chicago, Boston, Kansas City *and* Houston

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hatches and a single drum at the forward hatch.

These vessels will be fitted with steam steering gear and Clark-Chapman windlasses. There will be four mooring winches. Lighting will of course be by electricity.

Machinery

The motive power will be one triple expansion steam engine built by Richardson, Westgarth & Co., West Hartlepool, Eng. The cylinders will be 18 inches x 30 inches x 50 inches in diameter with a stroke of 36 inches. The engine will be rated at 1100 indicated horsepower.

Two single-ended, three-furnace Scotch boilers also built by Richardsons Westgarth, will be 13 feet 6 inches x 11 feet, and will have a total heating surface of 3460 square feet, a total grate area of 115 square feet, and a working pressure of 185 pounds.

The speed anticipated is 10½ miles in loaded condition. The fuel consumption it is estimated will be 18 tons of coal in 24 hours steaming. The hull and all machinery including the boilers, is to be built to the requirements and under the supervision of the British corporation classification for the Great Lakes and River St. Lawrence service.

Shamrock Towing Co. To Have Diesel Tug

The Shamrock Towing Co., 682 Twelfth avenue New York City, Capt. James J. McGuirl, president and general manager, recently placed an order with the Washington-Iron Works, Seattle, Wash., for a 270 brake horsepower Washington-Estep marine diesel engine. This engine is to replace a 200 indicated horsepower steam engine and Scotch boiler, in the steam tug ERIN. The ERIN is a wooden hull tug boat 75 feet long by 18.3 feet beam of a gross tonnage of 67, built in 1861.

The diesel engine to be installed is a 6-cylinder 4-cycle mechanical injection (solid injection) type rated at 270 brake horsepower at 250 revolutions per minute. This will be the first diesel installation made by this towing company. When the engine is installed, the towboat ERIN will be completely rebuilt and will be equipped with electric lights, an Arcola heating system and power driven fire and bilge pumps, so that after conversion to diesel drive this tug boat will be modernized throughout.

Southern Pacific S. S. Lines Order New Vessel

A fine new passenger and cargo vessel, 445 feet in length overall, 60 feet in breadth, with a mean draft of 25 feet 6 inches, a displacement of 12,000 tons and a speed of approximately 16 knots, has been ordered by the Southern Pacific Steamship Lines from the Federal Shipbuilding and Drydock Co., Kearny, N. J.

This vessel has been designed for the coastwise passenger and freight service between New York and the Gulf. She will be a single screw, oil-burning vessel, driven by steam turbines through double reduction gears. The hull will be constructed on the Isherwood system.

The utmost care has been taken in the adoption of all the latest devices for the prevention of fire. Automatic alarms and a smoke detecting system will be installed. There will also be a carbon dioxide system for extinguishing fire throughout all cargo and other closed compartments. But in addition to all these devices, a still more important feature is that every precaution has been taken in the construction of the vessel itself for the prevention of fire.

Throughout, this vessel will embody the most modern developments of naval architecture, comfort and luxury. Besides accommodation for 279 first cabin passengers and 100 third cabin passengers, she will also have an average deadweight cargo capacity of approximately 5700 tons, with a cubic cargo capacity of about 420,000 cubic feet.

The problem of economical and efficient handling of freight has been carefully studied. Completion of this new vessel is expected during the summer of 1927.

Launch Car Ferry

The new steel carferry, building at the Manitowoc Shipbuilding Corp., Manitowoc, Wis., for the Wabash railway, was successfully launched on April 14.

Nine Car Floats Ordered

The Pennsylvania railroad has placed a contract with the William Cramp & Sons Ship and Engine Building Co., for the construction of four steel car floats. Each float will be 250 feet long and 32 feet in breadth and will have two lines of railway track with a loading platform running lengthwise between the tracks. This type of construction permits the removal of freight in transit with all cars readily accessible. The floats will have a capacity of from 10 to 12 cars each. Under the terms of the contract the shipyard will deliver one float per month beginning Sept. 25 and ending Dec. 18.

The Bethlehem Shipbuilding Corp. has booked orders for five car floats, of which three are for the New York, New Haven & Hartford railroad; one for the Southern railway and one for the Western Maryland railway.

Order River Steamboats

The American Bridge Co., recently received a contract from the Carnegie Steel Co., for the construction of two steamboats of the same type and power as the WILLIAM G. CLYDE, and two steamboats of the same size and power as the CITY OF PITTSBURGH, recently sold to the Standard Oil Corp., of Louisiana.

The CITY OF PITTSBURGH is a steel river towboat with steam reciprocating engines of 1400 horsepower. This boat is 171 feet 10 inches long and 38 feet 10 inches wide.

Bid for Scout Cruisers

The following bids were opened by the secretary of the navy on April 1 for the building of two scout crusiers, the SALT LAKE CITY and the PENSACOLA. Bids on the PENSACOLA were for propelling machinery, as her hull is to be built at the Brooklyn navy yard. Bids on the SALT LAKE CITY were for the entire vessel.

Wm. S. Cramp Ship & Engine Building Co.	
For one ship complete and engines for both ships contractors design machinery	$10,900,000
For one ship complete and engines for both ships (Navy design machinery)	10,580,000
Newport News Shipbuilding and Dry Dock Co.	
For one ship and engines for both ships, high pressure	11,250,000
For one ship and engines for both ships, low pressure	11,150,000
For one ship and engines for both ships, medium pressure	11,200,000
New York Shipbuilding Corp., now the American Brown Boveri Corp.	
For one ship without engines, high pressure	10,410,000
For one ship without engines, low pressure	10,268,000
For one ship without engines, low pressure, if engine bid not accepted	10,343,000
For one ship without engines, medium pressure	10,350,000
For one ship without engines, medium pressure, if engine bid not accepted	10,425,000
For two sets of engines, high pressure	1,098,000
For one set of engines, high pressure	594,500
For two sets of engines, low pressure	1,023,000
For one set of engines, low pressure	554,500
For two sets of engines, medium pressure	1,037,000
For one set of engines, medium pressure	563,000
Bethlehem Shipbuilding Corporation	
For one ship complete and engines for both ships	11,960,000
For one ship complete with engines for only one ship	11,190,000

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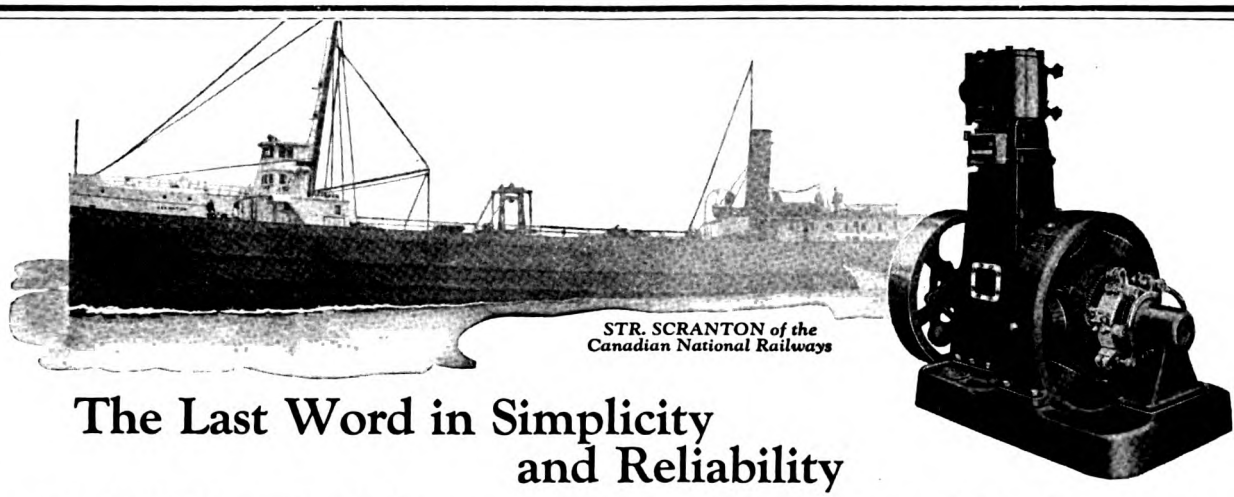


STR. SCRANTON *of the Canadian National Railways*

The Last Word in Simplicity and Reliability

ENGBERG Generating Sets have reached this position because every detail of their design and construction is the result of years of thorough study and investigation.

Lubrication System

The Oil Pump has direct drive, eliminating all eccentrics, gears, sprockets, chains, knuckle joints, etc.

The Oil Distributing Box on the outside of engine frame shows the operator definitely whether oil pump is working, and amount of oil flowing to each individual bearing. All feeds are adjustable. Each oil pipe has external access for inspection.

The automatic water drain and oil level in the base separates all condensation from the oil, so that the water continually and automatically drains off.

Send for catalog No. 105, which fully describes and illustrates ENGBERG Generating Sets.

ENGBERG'S ELECTRIC & MECHANICAL WORKS, 229 Vine Street, St. Joseph, Michigan, U. S. A.

ENGBERG

Engberg THE STANDARD FOR EFFICIENCY-DURABILITY-SERVICE

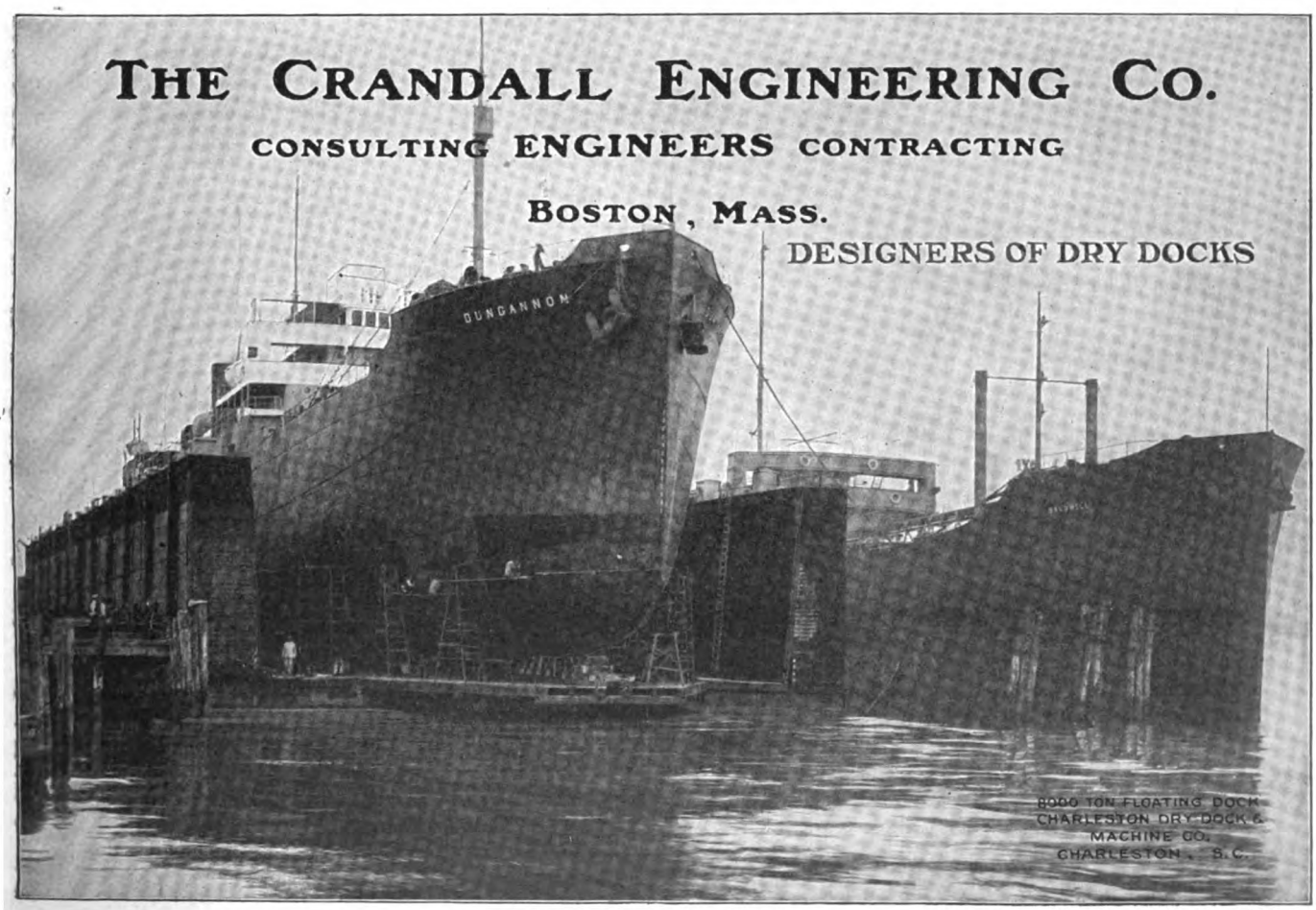
ENGINES · GENERATING SETS · GENERATORS · MOTORS · SWITCHBOARDS

THE CRANDALL ENGINEERING CO.

CONSULTING ENGINEERS CONTRACTING

BOSTON, MASS.

DESIGNERS OF DRY DOCKS



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For one ship without engines, high pressure 10,985,000
For one ship without engines, low pressure 10,505,000
For one ship without engines, medium pressure 10,570,000
For two sets of engines, high pressure 2,022,000
For one set of engines, high pressure 1,096,000
For two sets of engines, low pressure 1,831,000
For one set of engines, low pressure 1,007,000
For two sets of engines, medium pressure 1,831,000
For one set of engines, medium pressure 1,007,000

General Electric Company

For two sets of engines, high pressure 1,743,000
For one set of engines, high pressure 966,000
For two sets of engines, low pressure 1,783,000
For one set of engines, low pressure 986,000
For two sets of engines, medium pressure 1,783,000
For one set of engines, medium pressure 986,000

Westinghouse Electric & Mfg. Co.

This company offered a number of bids for two sets and for one set of engines, the bids varying with the particular types of turbines and gearing or driving.

The lowest bid for two sets of engines was 1,356,908
The lowest bid for one set of engines was 900,829

The other bids offered were higher in amount. The bids were the same for any one of the three steam pressures upon which bids were submitted.

NOTE the limit of cost of the above cruisers, set by congress $11,100,000 each, exclusive of armor and armament. The time limit set for the completion of the ships was 36 months. The bids have been turned over to the judge advocate general of the navy and will be passed upon by the chiefs of the bureaus of engineering and construction and repair, before going to the secretary of the navy for final award.

Increased Facilities Morse Dry Dock Co.

The Morse Drydock & Repair Co. has acquired by outright purchase, the drydocks and repair plant of Alderton Dock Yards Ltd. on Gowanus bay at the foot of Seventeenth street, Brooklyn, N. Y. The Alderton plant will be known and operated as the Upper yard of the Morse company.

This plant is equipped with modern piers, with one 8000-ton drydock and one 10,000-ton drydock. It has a modern machine shop 80 by 230 feet in size and a modern boiler and plate shop of the same dimensions, with complete machinery and tools to take care of both large and small work. In addition there are complete blacksmith, pipe-fitting, woodworking and other shops.

Diesel Electric Dredge

A new steel, diesel-electric 10-yard dipper dredge now building at the New York Shipbuilding Corp.'s yards of the American Brown Boveri Electric Corp. at Camden, N. J., for the Great Lakes Dredge and Dock Co., was successfully launched on April 22. This dredge will be of the most modern design and construction throughout. The application of diesel-electric to her machinery will mean economical and flexible power.

Bids Asked on Two Ships for Red D Line

On behalf of the Atlantic & Carribean Steam Navigation Co., 82 Wall street, New York, more generally known as the Red D. Line, Theodore E. Ferris, well-known naval architect, has requested bids on one and on two steel twin-screw passenger and freight steamships for the run from New York to Maracaibo, Venezuela.

The following yards have received requests to make bids Wm. Cramp & Sons Ship & Engine Building Co., Newport News Shipbuilding & Dry Dock Co., American Brown-Boveri Electric Corp., (New York Shipbuilding Corp.,) Sun Shipbuilding & Dry Dock Co., Federal Shipbuilding & Dry Dock Co., Bethlehem Shipbuilding Corp. The offers of these yards for building one or two vessels were to be in on April 29. At the time of going to press no definite information was available in regard to these bids.

The new vessels will have an overall length of 335 feet 6 inches, a length between perpendiculars of 323 feet, a molded beam of 51 feet, depth to upper deck at side, 22 feet. The designed load draft molded is 18 feet. The form and weight of the ship has been so worked out that it will be possible to cross the bar at Maracaibo with a deadweight of approximately 1000 tons. The displacement of the vessel will be 6460 tons in salt water at a draft of 18 feet, while the deadweight at this draft will be 3560 tons and the deadweight at 16 feet draft will be 2730 tons. Cargo capacity in bales will be 145,000 cubic feet and in grain, 159,000 cubic feet.

Main propelling machinery will consist of geared turbines applied to two shafts with a total of 4140 shaft horsepower. There will be two Babcock & Wilcox boilers burning oil and operating under forced draft, with 100 degrees superheat. For auxiliary power there will be two steam turbine generating sets of 75 kilowatts capacity each, of Westinghouse make or equal. Cargo will be handled by eight electric winches driven by 25-horsepower motors.

Passenger accommodations will consist of 112 in first class and 24 in second class. There will be 77 in the crew. The gross tonnage of the vessel will be 3200 tons and the net tonnage 1950. There will be two masts and one smoke stack. Classification is to be under American bureau of shipping AE-1. There will be five decks designated as A, B, C, D and boat deck. Owing to the extremely shallow water at the entrance to Lake Maracaibo, the successful contractor will have to guarantee the equipped weight of the ship, as one of the principal features.

Channel Construction

The New York Central railroad recently placed with the Atlantic Works, East Boston, Mass. a second order for ten barges to be constructed on the Ellis channel system. The new order is for covered barges, with a length over all of 100 feet, width 32 feet 8 inches, depth at side 9 feet 4 inches, length of house on deck 86 feet outside, width of the house on deck 29 feet 8 inches. These barges will cost about $25,000, each.

Shipbuilders To Discuss Senator Pepper's Bill

Ship builders from all sections of the country will gather at the ninth annual meeting of the Atlantic Coast Shipbuilders association which will be held in Philadelphia, May 10. In a letter to shipbuilders sent out by C. S. King, secretary of the association, reference is made to the bill introduced by United States senator, George Wharton Pepper of Pennsylvania, and now before the senate committee on commerce.

Under its terms, tariff protection would be extended to the ship owners through the application of the export commodity refund principal, to the construction of ships for the foreign trade. This proposal if enacted into law, will be designated as the overseas trade act of 1926. It provides for the issue of 25-year four per cent government bonds to compensate the American ship owner to the extent of the equivalent of the amount of duty collectable upon the component parts of a vessel if imported in fabricated form.

March Lake Levels

The United States lake survey reports the monthly mean stages of the Great Lakes for the month of March as follows:

Lakes	Feet above mean sea level
Superior	600.19
Michigan-Huron	577.52
St. Clair	572.28
Erie	570.02
Ontario	244.14

Arthur H. Pitz has acquired the interest of his partner, Oliver McMullen, in the firm of McMullen & Pitz, marine contractors and engineers, Manitowoc, Wis., and thus becomes sole owner. The concern is one of the best known on the Great Lakes, although it has devoted itself mainly to work on Lake Michigan.

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Oh, 'tis hemp and singing pine
for to stand against the brine.
Rudyard Kipling.

WHEN her gear creaks and her timbers strain she needs to be "tight". Real sailormen, those who love their ships, know that the only oakum to use to keep seams tight is the best. That's why most of them insist on

STRATFORD OAKUM

For nearly a century the seams of vessels staunch and true have been caulked with Stratford Oakum. Heavy weather then means little more than rolling and pitching, for Stratford Oakum keeps the seams tight.

Caulk right and she'll stay tight—that's the story when you use Stratford Oakum. Don't accept a substitute; there is none "just as good".

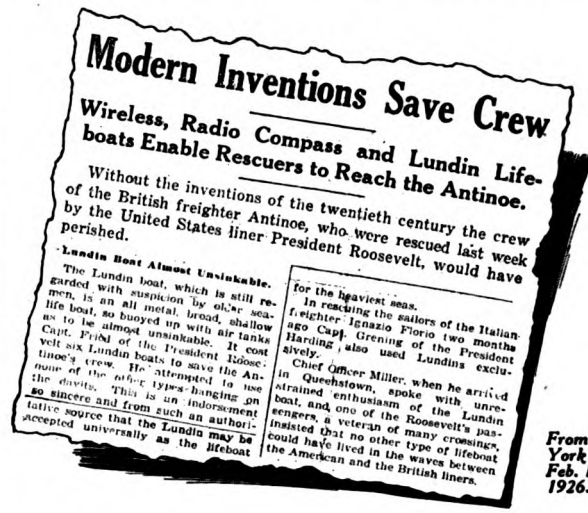
GEORGE STRATFORD OAKUM COMPANY

Jersey City,
New Jersey.

Also manufacturers of Cotton Wiping Waste

*

Lundin Life Boats
Saved Crew of Antinoe



Modern Inventions Save Crew

Wireless, Radio Compass and Lundin Lifeboats Enable Rescuers to Reach the Antinoe.

Without the inventions of the twentieth century the crew of the British freighter Antinoe, who were rescued last week by the United States liner President Roosevelt, would have perished.

Lundin Boat Almost Unsinkable.

The Lundin boat, which is still regarded with suspicion by older seamen, is an all metal, broad, shallow life boat, so buoyed up with air tanks as to be almost unsinkable. It cost Capt. Fried of the President Roosevelt six Lundin boats to save the Antinoe's crew. He attempted to use none of the other types hanging on the davits. This is an indorsement so sincere and from such an authoritative source that the Lundin may be accepted universally as the lifeboat for the heaviest seas.

In rescuing the sailors of the Italian freighter Ignazio Florio two months ago Capt. Grening of the President Harding also used Lundins exclusively.

Chief Officer Miller, when he arrived in Queenstown, spoke with unrestrained enthusiasm of the Lundin boat, and one of the Roosevelt's passengers, a veteran of many crossings, insisted that no other type of lifeboat could have lived in the waves between the American and the British liners.

From New York Sun. Feb. 1, 1926.

"THE Lundin boat is an all metal, broad, shallow lifeboat, so buoyed up with air tanks as to be almost unsinkable. Capt. Fried of the President Roosevelt attempted to use none of the other lifeboats hanging on the davits and without the LUNDIN LIFEBOATS, an innovation of the last decade, Capt. Fried might have been forced to stand powerless on the bridge and watch the freighter go down with all hands.

This is a sincere and authoritative endorsement that the "Lundin" may be accepted universally as the lifeboat for the heaviest seas.

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Welin Davit & Boat Corp.

305 Vernon Ave., Long Island City, N. Y.

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New Trade Publications

CENTRIFUGAL PRIMERS—Vacuum pumps adapted to exhausting air from centrifugal pumps, priming them, are described in a bulletin by the Connersville Blower Co., Connersville, Ind. Two sizes of vacuum pumps have been adapted to this use, for low and high lift pumps. Engineering data relating to the pumps are given.

ELECTRIC PUMPS—Pumps for continuous operation in cold storage, artificial ice and refrigerating plants where stoppage means disaster, are featured in a bulletin by the Goulds Mfg. Co., Seneca Falls, N. Y. It calls attention to a number of booklets on pumps which may be obtained by asking.

SMOKELESS COAL.—A description of the region where it is produced and of the advantages of its product are included in a booklet issued by the Broad Top Coal Operators association, Huntington, Pa.

MAGNETIC CLUTCHES.—Use of magnetic clutches on synchronous motor drives where the starting is severe are treated in a booklet by the Cutler-Hammer Mfg. Co., Milwaukee. Working data are given and features of the clutches are described.

PUMPS—Typical records of performance of its pumps in waterworks, sewage and fire service are presented in a bulletin by the Goulds Mfg. Co., Seneca Falls, N. Y. A list of its bulletins on engineering service is given that results of its experience thus prepared for pump users may be available to all on request.

REFRACTORIES—A refractory fire brick for severe conditions, fusing around 3400 degrees and adapted for metallurgical use is featured in a leaflet by the Ashland Fire Brick Co., Ashland, Ky.

BALL BEARINGS—Fafnir Bearing Co., New Britain, Conn., devotes the September number of its house organ to the applications of ball bearings to machine tools, making this issue serve as a booklet on this subject.

BLOWERS—Diamond Power Specialty Co., Detroit, has issued a bulletin featuring its blowers, with data sheets and tables of interest to users of power.

CONVEYORS—A brochure on conveyor applications has been issued by the Cevil R. Lambert Co., Detroit. It is designed to give information leading to reduction of handling costs.

ELECTRIC CONTROLLERS—Advantages of automatic control in starting large electrically driven machines by the controllers produced by the Monitor Controller Co., Baltimore, Md., is explained in a bulletin which shows a front and side view of the apparatus that takes charge when the starting button is pushed and attends to handling the current safely until the machinery is in motion and the period of possible danger passed.

DIESEL ENGINES—A bulletin by the Anderson Engine & Foundry Co., Anderson, Ind., is being sent out, describing a type of diesel engine just added to its line. It is heavier than previous models by this company, the crank shafts are larger and bearing surfaces longer. The engine has been simplified and the design refined.

CONVEYORS—With special emphasis on the principle of the descending spiral the Standard Conveyor Co., North St. Paul, Minn., has issued a bulletin illustrating the use of its various types of automatic conveyors on a number of uses.

STEEL FLANGED FITTINGS—An unusual test applied to a fitting manufactured by the Walworth Co., Boston, is described in a bulletin by that company. After hydrostatic test the fitting was placed between two lengths of flanged pipe and the whole supported between centers 18 feet apart and a load of 7428 pounds was lowered over the fitting until it was pressed to the floor. Results of the test are described.

ROTARY POSITIVE BLOWERS—A special type of blower for raw water ice systems is described in a bulletin by the Connersville Blower Co., Connersville, Ind. In addition to illustrations of various types for this use a table of specifications is given.

LIFTS AND STACKERS—Lewis-Shepard Co., Boston, has issued its annual bulletin of practice with its material handling equipment. Standard and new uses and special adaptations are covered. It suggests further uses of these devices beyond present practice.

Business News for the Marine Trade

Todd Drydock & Construction Co., 25 Broadway, New York, has plans for ship repair plant and dry dock at New Orleans, with Mississippi river frontage.

Smith & Williams Co. has been incorporated at Salisbury, Md., with $425,000 capital to take over the existing business and shipyards of Smith & Williams, John Smith, president.

St. Francisville Ferry Co., St. Francisville, Ill., has been incorporated with $2100 capital to operate ferries across the Wabash river, by W. C. Gillespie, Clyde and Ethel Caldwell. O. P. Estes, St. Francisville, Ill., is correspondent.

Smith & Williams Co., Salisbury, Md., has been incorporated with $425,000 capital to take over and enlarge the ship building and repair business formerly operated by the partnership of Smith & Williams. John Smith is president.

Bassett Boat Works, Eustis, Fla., builder of motor boats, is building an addition 48x96 feet, with launching device.

Starita Stevedoring Corp. has been incorporated at New York with 200 shares at $100 each and 100 shares common stock no par value by E. Bromberger, J. V. Kilroe and A. L. Tyler. Spitz & Bromberger, 56 Pine street, are attorneys.

Boyd, Weir & Sewell have been incorporated at New York for trade and navigation purposes with 3000 shares of common stock of no par value by W. Boyd, R. A. Sewell and H. A. Langdon. Haight, Smith, Griffin & Deming, 27 William street, are attorneys.

Houston I. F. C. Corp., New York, has been incorporated to serve as ship broker with $100,000 capital by H. J. Lesser, A. Neale, and J. H. Graves. McManus, Ernst & Ernst, 170 Broadway, are correspondents.

Midwest Transportation Co., Detroit, has been incorporated with 10,000 shares no par value to lease and operate vessels by Oscar J. Lingeman, 1518 Buhl building, A. E. O'Neal and Wilson W. Mills.

Barge Terminal Stevedoring Corp., New York, has been incorporated with $10,000 capital by C. Kearney, and J. C. Kronhite. P. J. McGrath, 1475 Broadway, is attorney.

American South African line has been incorporated in New York to engage in ocean commerce, with $1,000,000 capital by J. A. Farrell Jr., A. R. Lewis and A. W. Morrison. Fitzgerald, Stapleton & Mahon, 25 Broadway, are attorneys.

Lykes Steel Florida Line Inc. has been incorporated at New Orleans with $50,000 capital by Neal M. Leach, 424 Whitley building.

Moore-McClintic Steamship Co., A. V. Moore president, New Orleans, is planning to establish steamship service from New Orleans to Tampa to Sarasota.

Mandalay Steamship Co. has been organized at Tampa, Fla., to establish a steamship line from Tampa to Mobile.

Florida Navigation and Delivery Co. has been incorporated at New York with 1000 shares at $100 each and 1500 no par value by W. Wells, H. A. Steidel and W. Hall. H. Moerchen, 686 Lexington avenue, New York, is attorney.

Moran Towing & Transportation Co., New York, has been incorporated with $5000 capital to carry on a navigation business by A. F. Moran, J. H. Moran and E. J. Moran. Kelley, Hewitt & Harte, 41 East Farty-second street, are attorneys.

Peninsula State Steamship Corp. has been incorporated at New York with 2500 shares no par value by H. M. Young, R. Jacobs and J. M. Lord. J. M. Baum, 342 Madison avenue, New York, is attorney.

I. F. Corp. of New York has been incorporated at New York with $200,000 capital by H. J. Lesser, T. J. McManus and J. H. Graves. McManus, Ernst & Ernst, 170 Broadway, New York, are attorneys.

Potter Transportation Co. has been incorporated at New York with $10,000 capital by A. T. Burrougs, A. J. Johnston and A. Burns. H. Goldman, 120 Broadway, New York, is attorney.

George H. Flynn Corp. has been incorporated in New York with $100,000 capital to conduct a shipping business by Y. S. M. Rutledge, M. E. Chamberlain and G. Galdicott. E. M. Grout, 115 Broadway, is attorney.

Sturgeon Bay Shipbuilding & Dry Dock Co., Sturgeon Bay, Wis., has been formed with $100,000 capital to take over and operate the shipyard at that place, by Fred R. Schreiner, W. S. Caswell and Rowland W. Stebbins.

American Boiler Works, Erie, Pa., has been given a contract for six steel towing tugs for the New York bureau of canals. They will be powered with basoline engines built by the Buffalo Gasoline Motor Co.

Florida East Coast Navigation Co. Inc., Daytona Beach, Fla., has been incorporated with $100,000 capital by H. L. McDonald, 1230 Thompson place.

Eau Gallie Navigation Co., Eau Gallie, Fla., has been incorporated with $25,000 capital by C. R. Bowers and G. E. Spires.

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